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OAK RIDGE HEALTH STUDIES
OAK RIDGE DOSE RECONSTRUCTION
ANNUAL REPORT FOR CALENDAR YEAR 1997

Calendar year 1997 was the third full year of work on the Oak Ridge Dose Reconstruction. Activities on individual project tasks are summarized below, and hours billed and associated costs are summarized in Table 1.

Task 1-- Investigation of Radioiodine Releases from X-10 Radioactive Lanthanum Processing

Building upon and refining the work documented in the preliminary Task 1 report issued in 1996, the Task 1 project team performed more detailed analyses of quantities of radioiodine contained in the reactor fuel used for RaLa processing, quantities that were released to the environment, environmental transport, exposure pathway analysis, and dose and health risk assessment. The assessment that was documented in the draft Task 1 report issued in March 1998 was completed largely in 1997.

Task 2-- Investigation of Mercury Releases from Y-12 Lithium Enrichment

The Task 2 project team issued their draft report in July of 1997. This report documented many months of investigation of the uses of mercury at Oak Ridge, quantities that were released to East Fork Poplar Creek and to the air from Y-12 and from East Fork Poplar Creek, concentrations present in the environmental media over the years, exposure pathways that were complete, and potential doses and health risks to off-site reference populations. After issuance of the draft report, the Task 2 team received comments from a wide variety of reviewers on the ORHASP and external to the project. Work to address the comments received continued through the end of the year.

Task 3-- Investigation of PCBs in the Environment Near Oak Ridge

The Task 3 project team issued their draft report in August of 1997. The Task 3 investigation of PCBs in the environment relied heavily on environmental measurements of PCBs, because records or measurements of quantities released are essentially nonexistent. The project team interviewed many individuals that were involved with PCBs at Oak Ridge, and also documented other PCB users on the Clinch and Tennessee Rivers that likely contributed to the PCB burden of local surface water system. Task 3 investigators performed a two-dimensional uncertainty analysis, and estimated the fraction of PCBs in local surface waters that came from the Oak Ridge facilities. After issuance of the draft report, the Task 3 team received comments from a wide variety of reviewers on the ORHASP and external to the project. Work to address the comments received continued through the end of the year.

Task 4-- Investigation of Radionuclides Released from White Oak Creek to the Clinch River

The Task 4 team issued the draft report of the investigation in November of 1997. The investigation included many months of searching for records of measurements at White Oak Dam, independent estimation of quantities of radionuclides released, modeling of radionuclide transport in the waters and sediments of the Clinch River, documentation of locations and activities of people who have lived near the Clinch River over the years, identification of complete exposure pathways, exposure pathway analysis, and estimation of organ-specific radiation doses and health risks. After issuance of the draft report, the Task 4 team received comments from a wide variety of reviewers on the ORHASP and external to the

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project. Work to address the comments received began during the last month of the year.

Task 5-- Systematic Searching of Records Repositories

Most of the systematic document searching of the project came to completion during 1997. The most intensive searching focused on the Y-12 Records Center, K-25 Central Files, and the X-10 Records Center. Once each repository search was completed, a report was drafted and circulated for review. A summary of the overall document search effort, to be included in the Project Summary Report, was drafted and distributed for review.

Task 6-- Evaluation of the Quality of Uranium Monitoring Data and a Screening Evaluation of Potential Off-site Health Risks

The Task 6 team issued the draft report of its investigation in February 1997. An addendum was issued later in the year, to address methods to estimate concentrations of airborne uranium at the Scarboro Community and refined screening. Because conventional air dispersion models do not well represent effluent transport and dispersion in the complex terrain near Y-12, an empirical approach was used to estimate uranium concentrations in Scarboro based on ambient uranium measurements in Scarboro in the 1990s and estimates of quantities released from the Y-12 Plant during the same period. After issuance of the draft report and addendum, the Task 6 team received comments from a wide variety of reviewers on the ORHASP and external to the project. Work to address the comments received continued through the end of the year.

Task 7-- Performance of Screening for Additional Materials not Evaluated in the Feasibility Study

The Task 7 team issues individual reports or white papers on a number of materials during 1997. Some of these reports were prepared to address specific questions that could not be answered during the Dose Reconstruction Feasibility Study. Others described quantitative screening calculations that were performed to determine if various materials used at Oak Ridge complexes warrant detailed investigation. Particular attention was directed to materials with classified aspects, some of which could not be named in public documents. After issuance of the draft reports and white papers, the Task 7 team received comments from a wide variety of reviewers on the ORHASP and external to the project. Work to address the comments received continued through the end of the year. Several reports remained to be completed in 1998.

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OAK RIDGE HEALTH AGREEMENT STEERING PANEL
MINUTES FROM MARCH 19, 20, AND 21, 1997
UNIVERSITY OF TENNESSEE CONFERENCE CENTER
KNOXVILLE, TENNESSEE

Members Present: Mr. James Alexander Mr. Ralph Hutchison
Ms. Bonnie Bashor Dr. Norman Morin**
Ms. Barbara Brooks Dr. Robert Peelle
Dr. Paul C. Erwin Dr. James Smith
Dr. Joseph Hamilton* Mr. Paul Voillequé
Ms. Jacqueline Holloway Dr. Nasser Zawia

Contractors Present: Dr. Gordon Blaylock Mr. Young Moon
Ms. Gretchen Bruce Mr. Paul Price
Ms. Jennifer Cockroft Dr. Joe Thiessen
Dr. Owen Hoffman Mr. Tom Widner
Ms. Jan Hammonds

TDH Staff Present: Mr. Gary Douglas
Mr. Patrick Lipford
Mr. Pat Turri

*Attended March 19 and 20 only
**Attended March 20 and 21 only

Wednesday, March 19, 1997

I. OPENING BUSINESS

Mr. Paul Voillequé, Chairman, opened the meeting of the Oak Ridge Health Agreement Steering Panel (ORHASP) at 1:30 p.m., Wednesday, March 19 in Room 413-A of the University of Tennessee Conference Center in Knoxville. Mr. Voillequé welcomed everyone and asked all present to introduce themselves. After a few short announcements, he reviewed the main items of the last ORHASP meeting held December 5 and 6, 1996, in Oak Ridge. Mr. Voillequé then reported the objectives for the March meeting that included:

- A. Three major presentations
 1. Dr. Tom Mongan, Ms. Susan Flack, and Ms. Gretchen Bruce will present a report on Task 2 - Results of the Assessment of Y-12 Mercury Releases followed by 40 minutes for questions and answers;
 2. Mr. Paul Price will present a report on Task 3 - Results of the Assessment of PCBs near Oak Ridge followed by 40 minutes for questions and answers;

3. Mr. Tom Widner and Mr. Jack Buddenbaum will present a report on Task 6 - Results of the Screening of Past Uranium Releases followed by 40 minutes for questions and answers.
- B. Ms. Jennifer Cockroft and Ms. Susan Flack will present Summaries of Document Search Efforts K-25 & Y-12 (30 minutes) followed by 10 minutes for questions and answers.
- C. Mr. Tom Widner will give updates on Tasks 1, 7, and 4 (10 minutes each followed by 10 minutes for questions and answers for each task).
- D. Mr. Jack Hanley of ATSDR will give a review of the Epidemiology Feasibility Study from ATSDR's perspective.
- E. The subcommittees will meet separately. This is a good time for the dose reconstruction subcommittee to meet with the contractors to ask technical questions that did not get answered during the presentation.
- F. We will get back together for 15 minute presentations from each subcommittee.
- G. We will have 15 minutes for general panel discussion and 15 minutes for other business. The briefing book has a list of meeting dates through 1997.
- H. We will have a public meeting for the staff of the local health departments in this area. Dr. Erwin will moderate; Mr. Widner, Dr. Smith, Dr. Zawia will make presentations; Mr. Hanley will give a brief summary of the public education on PCBs that ATSDR is doing.

The next item was the approval of the minutes from the previous meetings. Mr. Voillequé invited comments and corrections to the approved minutes from the September 1996 meetings and to the draft minutes from the December 1996 meetings. After discussion and clarifications, Dr. Hamilton moved the minutes be approved as corrected. Ms. Holloway seconded the motion and it passed without any objections or abstentions.

At this point in the meeting, Dr. Hamilton referred the panel to a newspaper article in the briefing book. He pointed out that a group that identified itself as "Friends of ORNL" stated that the TSCA incinerator does not operate in a "pristine environment" and that there are other sources of airborne releases in the Oak Ridge area. After a brief discussion and a comment from a guest, Dr. Hamilton commented that any citizen should be fully informed about what environmental releases are occurring in the area in which they live.

The next agenda item was a report of the action items from the December 1996 meeting by Ms. Bashor as follows:

- A. Take out an ad asking people who have information to call for interviews, can be anonymous and cleared. *Done - see handout.*
- B. Get Mr. Bob Peelle's comments on the approved minutes. *Have not done yet, but will this meeting.*
- C. Ask Mr. Tom Widner for an estimate for 2nd level screening for uranium. *Done.*
- D. Look at any carry forward for 1997 for Ms. Barbara Brooks to use toward the 2nd level uranium screening. *Done - we had about \$300,000 carry-forward, but most will be for ChemRisk contract.*

- E. Find out about the medical monitoring program at Hanford. *Not yet.*
- F. Write a letter to DOE about continued DOE support for document searching. *Done - in briefing book.*
- G. Send Dr. Tim Joseph and Mr. Jack Hanley a copy of Dr. Puru Thapa's epidemiology feasibility report. *Done.*
- H. Ask the DOE-Oversight (DOE-O) office if they have any monitoring of mercury in soil in Scarboro so that we can check the reasonableness of DOE results from the sampling done in 1984-5. *Mr. Pat Lipford is working with Ms. Jackie Van Audenhove of DOE-O.*
- I. State explicitly in our cover letters when we want comments on reports back. *Done - ORHASP responses should be in by April 2.*
- J. Publicize well that the draft reports are out and available. *Done - notice is on the homepage, in the newspaper, and on the little green announcement cards.*

Following the action item report, Ms. Bashor gave a staff update. Highlights include:

- A. Mr. Gary Douglas worked on the minutes for the December meeting; helped with document searches, worked on CDC courses on epidemiology and environmental health sciences, routine staff communications; reviewing uranium report; working on getting outside local reviewers for uranium report
- B. Mr. Pat Lipford has worked with ChemRisk on the newsletter; it went out March 6. Pat worked on the ad and had it in newspapers in Oak Ridge, Knoxville, Clinton, Kingston, Lake City, and Wartburg. He has also helped with document searches and getting ready for the meeting.
- C. Mr. Pat Turri worked with Ms. Bashor and Dr. Wadley getting ready for the three joint Senate-House committee hearings on the health problems of the "exposed" and the TSCA incinerator and K-25 in general; he went to all three and helped to answer their questions.
- D. Ms. Bashor, also, prepared Dr. Wadley for the hearings and gave testimony and answered questions. She has, also, prepared a defense of the panel contracts for the budget committee of the legislature. She has been battling the bureaucracy to get the contracts finalized for the outside peer review. The contracts should be in place by April 1. She has, also, been trying to get a contract with Mr. Leo Williams to help us with basic communications - a press packet, press releases, advice on the newsletter, etc. That should be in place by April.
- E. Staff attended a Q-meeting with Ms. Cockroft and Ms. Flack; Mr. Voillequé, Dr. Smith, Mr. Alexander; Dr. Joseph, Mr. Arvin Quist, and Mr. Gabe Marcianti; and Ms. Jean Ottinger and Mr. Doug McCoy of DOE-O.

At the conclusion of the staff update, Dr. Zawia asked if at some point the panel could be briefed about the TSCA incinerator due to the number of recent newspaper articles about it's operation. Ms. Bashor gave an overview of the Department of Health's report to the state legislature. Several panel members had comments about the articles in the Nashville newspaper. Mr. Voillequé reminded the panel that the incinerator, per se, was

not a source of off-site releases to be screened by ChemRisk, except PCBs as part of Task-3. Mr. Hutchison commented that any final report should be clear regarding ORHASP's review of the incinerator.

II. TASK 2 REPORT ON THE RESULTS OF THE ASSESSMENT OF Y-12 MERCURY RELEASES

Mr. Widner presented a summary of the draft report for Task 2. He gave the panel an organizational outline of the report and a summary of results to be in the draft report. Mr. Widner discussed some the differences between the work done by the Mercury Task Force in 1983 and the current Task 2 Mercury study. The key points for the source term are the background of mercury operations and the differences in the Mercury Task Force 1983 report and ChemRisk's findings; ChemRisk found an increase of 17% for mercury releases to water (almost 42,000 pounds) and a 41% increase in mercury releases to air (about 21,000 pounds). ChemRisk had more complete concentration and flow rate data for East Fork Poplar Creek than did the Mercury Task Force. ChemRisk used corrected indoor air concentrations of mercury and corrected building ventilation rates.

Ms. Gretchen Bruce said that air modeling shows that the air concentration of mercury in populated areas of Oak Ridge from ventilation of buildings is about three times lower than the air concentrations from volatilization from the floodplain. There was discussion of the amount of volatilization from the floodplain pointing the need for clarification and explanation.

Mr. Widner discussed refinements in the exposure assessment for air exposures and for the populations exposed. It was previously assumed that the 90% decrease in water concentration of mercury between Y-12 and the concurrence of East Fork Poplar Creek and Poplar Creek was due entirely to volatilization. The current iteration assumes that dilution contributes to the decrease, with a maximum loss to air of 50% rather than 90%. The current iteration incorporates probability distribution functions for sensitive subgroups of adult females of child-bearing age and children under 3 years of age. The exposure groups now include children near Robertsville Junior High School.

The toxicity of various mercury compounds is being handled in terms of relative bioavailability. Calculated doses will be compared to no observed adverse effect levels, reference doses, etc. for specific compounds.

The results for the current iteration indicate that exposures through air pathways are potentially significant for the years 1953 through 1962 for direct inhalation and deposition onto vegetables. Fish ingestion is potentially significant for populations that consumed contaminated fish.

III. SUMMARIES OF DOCUMENT SEARCHES AT K-25 AND Y-12 FOR TASK 5

Ms. Jennifer Cockroft presented a report on the progress of document searches at K-25. She stated that the systematic search at K-25 has been centered at K-25 Site Records Center. This is the

largest repository of documents regarding K-25 operations, and it contains most of the historical information. She said there are two categories of records at this repository:

1. Inactive records. These are boxed records that include accounting, medical, engineering and several other groups totaling approximately 15,000 boxes.
2. Reports collection. This collection contains approximately 1,200 individual files on shelves. These records contain various progress reports and research papers dating from 1944 to 1983. Many are still classified.

Ms. Cockroft reported, in detail, her search methods that included keyword searches, database review, interviews with records custodians, and "aisle walking." She stated that of the 15,000 records reviewed, 360 were found to be relevant, and more than 200 documents were requested for the study.

The next portion of this report was given by Ms. Susan Flack and detailed the systematic search effort at Y-12 Records Center. She stated that this repository contains almost 22,000 boxes and an additional 1,000 cubic feet of shelved documents. All are classified. The shelved documents are indexed, and this index has been reviewed. The boxed documents are only partially indexed.

Ms. Flack said that the majority of the boxes (about 1000 boxes) are not relevant. Most contain things like weapons parts x-rays and weapons assembly QA files. Some boxes contain health physics, radiation safety and technical department documents. She said the review of this subset of boxes has been completed and she is now starting her random search of the remaining boxes.

At this point in the meeting, Mr. Voillequé asked what arrangements have been made for the disposition of all the documents when the study ends. After some discussion, Ms. Brooks said her notes indicated that the state will be the ultimate repository for the study documents. Dr. Peelle said he has the same understanding. Ms. Bashor said she would review past meeting minutes for this topic.

Ms. Brooks asked about overall progress of Task 5 at repositories other than the two centers just reported on by Ms. Cockroft and Ms. Flack. Dr. Shonka, the Task 5 manager, reported that all document searches should be completed by June 1997 with July reserved for DOE Record Center if necessary. This time also included 160 man hours to complete OSTI.

Thursday, March 20

IV. TASK 3 - RESULTS OF THE ASSESSMENT OF PCBs NEAR OAK RIDGE

Mr. Price presented an overview of Task 3 activities. Since the last meeting, he has followed up on three specific issues: the exposure pathways to farm families, the turtle ingestion pathway, and the uncertainty of the reference dose (RfD). Mr. Price is trying to separate the uncertainty of the exposures from the uncertainties associated with the RfD. In addition, he will work with the mercury investigation team to look at potential exposures to PCBs at Robertsville Junior High School at the walking path across East Fork Poplar Creek. The final report will be sent out in late spring or early summer.

The current characterization of the angler population is taken from literature values. Mr. Price said that a survey of fishermen would decrease the uncertainty in the risk assessment, but that a survey would not change the results by an order of magnitude. The risks associated with PCB, dioxin, and furan releases from the TSCA incinerator were based on data from the trial burn in which 7,200 pounds of PCBs, dirt and ground-up capacitors, were used. In the 1990s, 136 to 168 pounds of PCBs were burned in the incinerator; therefore, Mr. Price believes that the trial burn data is adequate to characterize the risk from PCBs, dioxins, and furans. He stressed that dioxins and furans from other sources were not considered in this risk assessment.

Mr. Price discussed key findings about farm families using Jones Island, along the Clinch River and East Fork Poplar Creek, and beef and milk consumers. The exposure pathways for farm families using Jones Island and along the Clinch River are incomplete. The exposure pathway for beef and dairy cattle activities is complete for East Fork Poplar Creek, but the exposed population is very small. Beef and milk were not typically sold to local markets. Any beef or milk occasionally sold to a local market would be mixed with other beef or milk; therefore there are no populations with regular exposure to PCB contaminated beef or milk.

The screening level calculation for the consumption of turtles along East Fork Poplar Creek resulted in potential risks for cancer and noncancer endpoints above the numerical guideline. However, the population consuming turtles is expected to be small and the data on consumption rates and concentrations of PCBs is very uncertain. Mr. Price posed the following question to the ORHASP, "Should this pathway undergo further evaluation?". Ms. Jacque Van Audenhove said that the DOE-Oversight office had some data on PCB concentrations in turtles.

Mr. Price is using the state-of-the-art uncertainty analysis in the reference dose. Three RfD distributions were derived by assuming different distributions in the uncertainties for interspecies, interindividual, and subchronic to chronic variability. The three RfD distributions were based on: 1) EPA default factors, 2) empirical data sets, and 3) empirical data sets with the modification that the interspecies uncertainty is greater than zero and truncated at 1. The results of this kind of uncertainty analysis give a distribution for a threshold below which no adverse effect is seen. Using the third RfD distribution, the 95% lower confidence limit around the derived median threshold value is well above the EPA-derived RfD.

Mr. Price, also, did a two Dimensional Monte Carlo analysis to separate the effects of uncertainty (imprecision of measurement) and variability among individuals. This method assumes independence of uncertainty and variability. The conclusions are that: 1) inclusion of additional toxicological information suggests that the risks are probably lower than the earlier assessment indicated, 2) there is about a 50% chance that more than 10% of anglers are receiving doses that could affect sensitive individuals, 3) it is impossible to estimate the number of affected people because the number of sensitive individuals is unknown, and 4) the majority of anglers are not likely to be affected.

Additional research needs include: 1) additional core samples to better define the Oak Ridge Reservation contribution to PCBs in the Clinch River, 2) angler surveys, including questions about

turtle consumption, and 3) sampling of East Fork Poplar Creek biota and soil to refine the assessment for the small population of farm families along the creek.

V. TASK 6 - RESULTS OF THE SCREENING OF PAST URANIUM RELEASES

Mr. Tom Widner provided an update of progress on Task 6. The draft for this task was provided to all panel members and State staff prior to the meeting. Mr. Widner invited comments on the report encouraging all to share their feelings about the content and the structure. He noted that comments made on the earlier progress report had been incorporated into this draft where appropriate but that many suggestions were no longer relevant since the document had such extensive rewrite. There can be no new work initiated for this task since all of the hours allocated to this task have been expended. Comments suggesting major changes involving more research or changes in models would be impossible and would have to be passed to any future work by the State.

The conclusions for Task 6 were summarized by Mr. Widner. For Y-12, the release totals for uranium reported officially are incomplete and not suitable for risk assessment. Estimation by the team were five times higher. For K-25/S-50 the releases estimated by the team were greater than double those reported officially. The contributions of the purge cascade and cylinder fire tests did not contribute significantly to the site totals. The S-50 plant is poorly documented and more research would be needed for a realistic assessment. For combined assessment of all sites to radiological risks, the first level screen exceeds the 1 in 10,000 numerical guideline. For the chemical toxicity, estimated kidney burdens exceed one published threshold of 0.02 micrograms/gram, but falls below another published level of 1.0 micrograms/gram.

Mr. Widner stressed the conservatism of the screening value and the need to refine the assumptions and models used in the Level I screen. Dr. Hamilton felt it was important to go further and encouraged the pursuit of additional funding to complete the analysis. He was especially concerned about the modeling and the lack of consideration of the ridge and valley effects.

Mr. Jack Buddenbaum presented a summary of steps that need to be considered to effect a Level II screen. They include for Air releases at K-25/S-50:

- o Search for additional S-50 information.
- o Evaluate quality of other effluent monitoring data.
- o Gather information on biases in effluent sample collection and measurement data.
- o Update master uranium release list based on new information.
- o Develop reasonable building release fractions for K-25 releases.
- o Evaluate quality of DOE release estimates for 1985-1995.

For Air releases at Y-12:

- o Search for additional source term information.
- o Develop reasonable average depleted uranium release estimates.
- o Gather ventilation flow rates for important Y-12 buildings.
- o Identify or develop detailed profiles for important stacks and changes with time.
- o Confirm or modify assumptions used to reconstruct air releases.
- o Review basic monitoring data and determine quality of releases from 1989-1995.

These were not in the original plan.

Other considerations needed for Level II screen include, for Surface Water and Soil, average soil and water concentrations should be used, average bioaccumulation factors should be used, and average or "typical" parameter values should be used. More review of chemical toxicity values is required for a second screen.

Mr. Ralph Hutchison suggested that ChemRisk review the comments of the K-25 tiger team report which was critical of historical sampling data. Also, he noted that it was his understanding that the TSCA incinerator burned waste that contained uranium that came from other DOE facilities and thus any estimates made based on the Oak Ridge site source might be non-representative of the actual releases.

Dr. Zawia inquired about the use of release values based on the average of all air sampling stations rather than using the actual air sampling station values at Scarboro to characterize this community's exposure. Mr. Buddenbaum acknowledged that it would be preferred to have values from the tower in Scarboro.

Dr. Hamilton, as well as, Drs. Peelle and Zawia encouraged the State to pursue investigation for additional funds needed to perform additional work to refine the screening calculation for the Scarboro community.

Ms. Sandra Reid reminded the panel of the need to make an assessment of the impact of both uranium and mercury as additive burdens to the community since they are both nephrotoxins. Dr. Peelle agreed that the panel felt it was important to consider multiple exposures.

Another member of the community who was familiar with fire testing of UF₆ cylinders suggested that ChemRisk's estimates for releases were too low for this operation. He stated that there were thousands of pounds involved not just 1000 pounds. ChemRisk said they would investigate this value.

VI. ATSDR REVIEW OF EPIDEMIOLOGY FEASIBILITY STUDY

Instead of talking directly about the epidemiology feasibility study, Mr. Jack Hanley told the panel of preliminary plans for a biomarker study in people most likely to be exposed to PCBs through ingestion of local fish. The protocol design is in the early stages, and Mr. Hanley wants feedback on the usefulness of the study and how it should be done. It was suggested that in addition to questions to participants about fishing and fish consumption habits, that some questions be added that ask about eating turtles.

VII. UPDATES ON TASKS 1, 7, AND 4

- A. Mr. Tom Widner gave an update on Task 1, *Iodine-131 releases from the RaLa Processing*. The task 1 overview included a plan for refinements on the following: the source term, iodine chemistry in the atmosphere, atmospheric transport to specific locations, deposition and retention on pasture vegetation at specific

locations, transfer to milk, and the evaluation of additional exposure pathways. Mr. Widner discussed the refinements for each part of the task in some detail.

- B. Mr. Tom Widner gave an update on Task 7, *Additional Screening of Materials Not Evaluated in the Dose Reconstruction Feasibility Study*. The update covered the following areas: the progress in evaluation of materials with classified aspects, documentation of knowledge about materials of concern, and the plans for quantitative screening. Mr. Widner stated that ChemRisk will have finished all the screening of classified materials by May 1997. Then we will know if the panel needs to ask DOE to declassify any of the classified materials.
- C. Ms. Jana Hammonds presented the update for Task 4, *Radionuclides Released from White Oak Lake*. The update that was presented covered the following areas: the source term, aquatic transport modeling food chain transfer, exposure parameters, internal dosimetry and external dosimetry. Dr. Peelle brought up the sampling of private wells on the southwest side of K-25 by DOE and the possibility of the wells becoming contaminated from the underground flow of river water. The panel and members of the audience discussed the issue of tritium contaminating the water at the Kingston water intake. Ms. Hammonds agreed to follow up with those who raised questions.

VIII. SUBCOMMITTEE REPORTS

A. Dose Reconstruction Subcommittee

Mr. Paul Voillequé gave the report of the Dose Reconstruction Subcommittee. He said they discussed two main topics. 1) the level one screening for uranium and 2) the issue of the volatilization of mercury from the floodplain.

1. Mr. Voillequé said that the analysis team should attempt to locate more air monitoring data in order to improve the face validity of the conceptual screening for the Scarboro community. Additionally, the possibility of multiple insults to a common person in the area of East Fork Poplar Creek needs to be investigated in greater detail.
2. Mr. Voillequé said the study team may need to complete a mass balance for mercury and review the modeling of the mercury tree ring data which indicates that the airborne transport of mercury may be the significant pathway beyond the EFPC floodplain.

Mr. Voillequé concluded by saying the study teams need to coordinate more on the issue of multiple insults and atmospheric transport.

B. Health Study Subcommittee

Dr. Paul Erwin gave the Health Study Subcommittee report. He reported that the cyanide exposure issue of the past several months has been addressed. The citizens group that refers to themselves as "The Exposed" is now working with two physicians, one of their choosing and the other of DOE/Lockheed-Martins's choosing. He reported the Health Study Subcommittee will continue to keep this topic open because the workers that comprise "The Exposed" have similar health complaints as the Citizens for Better Health raised some time ago. The subcommittee also addressed the issue of health outcomes. Current data indicate that Anderson County does not have a statistically different cancer mortality rate than the rest of the State. This also includes the surrounding counties.

Finally the subcommittee framed four questions that should be addressed in the dose reconstruction:

1. Of the radionuclides and chemicals reviewed in the dose reconstruction, which of these are thought to be of current health concern?
2. Could these be measured relatively simply by blood or urine testing?
3. What specific body functions are most likely to be affected?
4. Could these be measured relatively simply?

The subcommittee has referred these four questions to the Agency for Toxic Substances and Disease Registry in order to coordinate with their proposed efforts in this area.

C. Communication Subcommittee

Mr. Ralph Hutchison gave the Communication Subcommittee report. There were three major topics covered:

1. A schedule outline for the review and comment periods for the forthcoming final reports. This complete outline is to be made available in a one-page newsletter to be mailed in mid-May 1997. This newsletter will also include information as to where copies of the reports are located for public review.
2. The subcommittee also recommended ORHASP meetings in the following locations:
 - May 1997 - Oak Ridge
 - September 1997 - Oak Ridge
 - November 1997 - Roane County (including a public meeting)
 - March 1998 - Oak Ridge

Also, if possible, the Dose Reconstruction Subcommittee might try to meet in June 1997 in San Antonio, Texas during Health Physics Society meeting.

3. The subcommittee proposed the panel consider publishing a short document placing the study in context, and this document could include recommendations for future actions.

In conclusion, the subcommittee is still developing a comprehensive communication plan to be presented at the September ORHASP meeting.

D. Quality Assurance Subcommittee

Mr. Jake Alexander gave the Quality Assurance Subcommittee report. The two major topics were:

1. A reiteration that all panel members need to review all reports to the best of their individual ability.
2. The state should continue with the process of securing the services of outside expert reviewers.

IX. OTHER PANEL BUSINESS

At the conclusion of this report, the panel had another lengthy discussion regarding the location of a repository for all the study documents. Some suggestions include the DOE Public Reading Room, the State of Tennessee Archives, and the University of Tennessee Library.

It was agreed that the panel needs to get together for one day to discuss where we are in the dose reconstruction and where we should go. The technical members need to meet with ChemRisk between the May and September meetings.

There being no further business, Mr. Voillequé adjourned the meeting.

Attested to as the official record of business of the ORHASP by:

Paul G. Voillequé

7 June 1997

Mr. Paul G. Voillequé

Date

OAK RIDGE HEALTH AGREEMENT STEERING PANEL
MINUTES FROM May 21-23, 1997, MEETING
COMFORT INN
OAK RIDGE, TENNESSEE

Members Present:

Mr. Paul Voillequé
Mr. Patrick Lipford
Dr. Robert Peelle
Dr. Nasser Zawia
Ms. Jacqueline Holloway
Mr. James Alexander
Dr. James Smith
Mr. Ralph Hutchison
Ms. Barbara Brooks
Dr. Paul Erwin
Dr. Joseph Hamilton

Contractors Present:

Mr. Tom Widner (Project Manager McLaren Hart/ChemRisk)
Mr. Jack Buddenbaum (McLaren Hart/ChemRisk)

TDH Staff Present:

Ms. Bonnie Bashor
Mr. Pat Turri
Mr. Gary Douglas

Wednesday, May 21

1. OPENING BUSINESS

Mr. Paul Voillequé, Chairman, opened the meeting of the Oak Ridge Health Agreement Steering Panel (ORHASP) at 1:000 p.m., Wednesday, May 21, at the Comfort Inn in Oak Ridge. Mr. Voillequé welcomed all guests and panel members present. Members and guests introduced themselves.

The panel discussed minutes from previous meetings. Dr. Hamilton moved that the March minutes be approved as amended. Mr. Hutchison seconded the motion, which the panel passed on a voice vote.

Ms. Bashor told panel members that Earl Leming, director of the Tennessee Department of Environment and Conservation's DOE Oversight Division, and John Owsley, assistant director of the division, would be on hand Thursday to discuss permitting of DOE's Toxic Substance Control Act (TSCA) Incinerator at the K-25 Site. Ms. Bashor also told the panel DOE had established a steering panel to examine environmental and health issues concerning the incinerator and K-25 in general.

Mr. Lipford told the panel that the Health Study team had postponed a decision on repositories for the Health Study report and accompanying materials. Mr. Lipford said the team was working to develop an incentive package for support and maintenance of the materials in the next couple of months.

Ms. Bashor discussed creation of a summary document that would address combined exposures to the public of contaminants under consideration by the Health Study. Mr. Widner said investigators are working on such a document.

The panel discussed a planning meeting scheduled for July 16 and 17 in Nashville. The first day of the meeting will focus of an overview on the project by Mr. Widner and on discussion. The second day will include a discussion and questions on technical issues relating to the Health Study.

Mr. Voillequé noted that Ms. Bashor had been replaced by Mr. Lipford as state Project Director for the Health Study. Mr. Lipford noted that the change in personnel arose about four weeks before. He said he was honored by the assignment and believed in the goals of the project.

Mr. Voillequé noted that Dr. Zawia had been awarded a grant from the National Institute of Mental Health to study the effects of lead exposure to developmental markers in the brain. Dr. Zawia noted that the investigation is an animal study and will examine tissue in the brain.

Mr. Hutchison stressed that he did not want to receive all the paperwork related to contracts with people doing reviews of the task reports. Instead, he said he would prefer to receive a one-page resume or curriculum vitae for the reviewers.

Mr. Widner noted that a photographer would be on hand before lunch to photograph the panel and project team.

2. PRESENTATIONS

Ms. Susan Flack discussed Task 2 (mercury). She said the final report of Task 2 should be ready in two to four weeks. She said Dr. Owen Hoffman of SENES Oak Ridge is working with the task team to reduce the uncertainty in mercury risk estimates.

Ms. Flack said there are three main sources for documents at Y-12 related to mercury: specific mercury files, boxes in the Y-12 records center and records of the Health and Safety Division. She said the project team reviewed more than 1,200 documents in the mercury files and more than 800 boxes at the plant records center, which had building air data and results from surface water sampling at East Fork Poplar Creek. Ms. Flack said the project team interviewed more than 30 people, including members of DOE's 1983 Mercury Task Force.

Ms. Flack said this search yielded three key findings:

1. Historical building ventilation drawings. Ms. Flack said a former Y-12 ventilation engineer reviewed these drawings and provided independent estimates of ventilation for the main lithium production buildings. She noted that this was one of the largest sources for disagreement between the Task 2 estimate of mercury releases from Y-12 and that of the 1983 Mercury Task Force.
2. The project team found missing surface water sampling reports for East Fork Poplar Creek for the early 1950s and 1960s.
3. The team found building air concentrations for two additional lithium processing buildings and was able to look at the contribution of pilot plant operations to mercury releases.

Ms. Flack shared the principal conclusions of the source term investigation:

- Air and water discharges from the lithium enrichment process at Y-12 were the main source of mercury releases to the environment. Releases from K-25 and X-10 (Oak Ridge National Laboratory) were less than 1 percent of the total releases.
- Estimates of mercury releases to the air are 40 percent higher than previous estimates, with the biggest different being at the Alpha 4 building.
- Estimates of waterborne releases were about 15 percent higher than previous estimates. The most significant difference was estimates for the early 1950s, for which the Task 2 team located additional data. The Task 2 estimate agreed with previous estimates for other time periods.
- The task team learned from the members of the public about East Fork Poplar Creek farm families, which were exposed to mercury through each of the pathways.

Mr. Hutchison asked about the location of Oak Ridge "community receptors" north of Oak Ridge Turnpike, noting that others in Oak Ridge lived closer to Y-12.

Mr. Tom Mongan of McLaren Hart/ChemRisk said the main source of airborne mercury emissions in Oak Ridge was volatilization from East Fork Poplar Creek. He said Pine Ridge blocks direct air transport between Y-12 and the nearby Scarboro community.

Ms. Flack said the team chose several scenarios for people who were likely exposed to the mercury releases. These included adults and children living along East Fork Poplar Creek, adults and children living in Union Valley (these people were analyzed only for the air pathway), adults and children eating fish caught downstream from Y-12, and 10- 14-year-old children attending Robertsville Junior High School, which borders East Fork Poplar Creek.

Mr. Mongan said the team estimated exposure concentrations for surface water, air, and soil and sediment. For the water pathway, he noted that the mercury was diluted as it traveled downstream. For the air pathway, the team looked at Union Valley as well as the area along East Fork Poplar Creek.

In analyzing mercury in fish, Mr. Mongan noted there is a concern worldwide regarding methyl mercury in fish. He noted also that the team did not have access to data on fish from the early years of the lithium operation. He said the team looked at estimates of mercury concentrations in East Fork Poplar Creek fish after 1970 and at estimates for other sites with high levels of mercury. He said the team also reviewed the maximum level of mercury found at fish and the level at which mercury is lethal for fish.

He said the team also looked at core samples from Poplar Creek, the Clinch River and Watts Bar Reservoir. He noted that cores can be dated according to the radioactive decay of cesium-137, peak releases of which occurred about the same time as the mercury releases. He said the team estimated a relationship between mercury soil concentrations and levels in fish, and concentrated on those types of fish likely to have been caught and eaten.

Mr. Mongan said there were likely exposures to mercury above the reference dose. He said the highest exposure was through fish, and the most highly exposed group was recreational fishermen along the Clinch River and Poplar Creek. He said the median exposure estimate of this group is close to the "no observed adverse effect level" and stressed the importance of uncertainty in these estimates.

He said the next highest exposure was from airborne mercury inhaled by an East Fork Poplar Creek farm family. For 1955-59, the estimated median value was above the Environmental Protection Agency's (EPA) Reference Dose but below the "no observed adverse effect level."

Mr. Mongan said that for the non-farm family, the air-to-vegetation pathway was above the reference dose for inorganic mercury.

Mr. Mongan reviewed mercury levels of tree rings in Oak Ridge. He noted that trees don't take in mercury effectively from the soil, but they do take it in effectively from the air through their leaves. He said it is difficult to do analysis of environmental mercury analysis from tree rings, noting that different trees lead to different conclusions. He noted also that mercury is mobile in sap wood and can move from ring to ring. Therefore, researchers can't use tree rings to establish average airborne mercury concentrations. He said an estimated 10 percent of mercury that was released to East Fork Poplar Creek was released to the air above the creek. Taking uncertainty into account, he said, the range is 5 percent to 50 percent.

Dr. Smith asked how the study should address estimated risks that are above the reference dose but below the "no observed adverse effect level." It was agreed this is a quandary; all that can be said, he noted, is that the health risk is above a risk index of 1 but levels are below that which has been shown to cause adverse health effects in animal studies.

Ms. Bashor asked if the Task 2 team had looked into the research upon which the reference dose is based. Mr. Mongan said they had, and this issue would be addressed in the Task 2 report.

Dr. Erwin asked what the latency period is of health effects associated with acute mercury poisoning. Mr. Mongan said the latency is about 18 months; the health effect of most concern, he said, is when pregnant women have high mercury levels the central nervous system of the fetus is being formed.

Dr. Peelle asked where the community receptors are for the mercury study. Mr. Mongan said they are a little downstream of Robertsville Junior High School.

Dr. Zawia said it is possible mercury traveled over Pine Ridge and into the Scarboro community, noting this has been shown for uranium. He asked about mercury releases that would have drained into Bear Creek instead of East Fork Poplar Creek. Ms. Flack noted that the Y-12 sewage system took drainage to the east, into East Fork Poplar Creek.

Dr. Zawia asked how many farm families were found in the study. Mr. Widner responded that there was one, and Ms. Flack noted that the family seemed to be in good health and unconcerned about the mercury exposure.

Dr. Hamilton asked why mercury concentrations are shown to be higher on one side of the creek than on the other. Mr. Widner said he would revisit the models used in the study.

Dr. Susan Gawarecki, executive director of the Oak Ridge Local Oversight Committee, asked if sources of airborne mercury releases were considered other than from Y-12. Mr. Widner responded that levels of mercury in air releases from sources other than Y-12 were substantially lower than those from Y-12.

Mr. Wayne Clark, a property owner along East Fork Poplar Creek, said he had been told that questions about speciation of the mercury in the flood plain soil had been answered,

but the presentation suggested those questions have not been answered. He asked how he should approach his property. Mr. Widner said it is difficult to determine different forms of mercury, with different techniques producing different results.

Mr. Widner discussed the amount of mercury released from Y-12. He said that 72,000 pounds were released to East Fork Poplar Creek during the peak year, 1955. He said the study assumed 10 percent had been volatilized, or 7,200 pounds.

After the presentation, the panel adjourned for the day.

THURSDAY, MAY 22

Panel members present

Mr. Paul Voillequé
Mr. Patrick Lipford
Ms. Jacqueline Holloway
Dr. Robert Peelle
Dr. Nasser Zawia
Mr. James Alexander
Dr. James Smith
Ms. Barbara Brooks
Dr. Paul Erwin
Dr. Joseph Hamilton

Contractors present

Mr. Tom Widner (McLaren Hart/ChemRisk)
Dr. Kathleen Thiessen (SENES Oak Ridge)
Ms. Jennifer Cockroft (McLaren Hart/ChemRisk)

Mr. Voillequé opened the May 22 meeting at 8:30 a.m.

Mr. Lipford noted that the September panel meeting is set for Sept. 24-26 and asked if members would prefer that it be moved to Sept. 17-19. After discussion, the panel concluded that the alternative dates would present a conflict.

Dr. Hamilton noted there are questions that the panel cannot answer. These include the possible synergism between different contaminants. Dr. Zawia noted also that the different contaminants may have compounding effects, such as when they target the same organ.

PRESENTATION ON TASK 7

Dr. Thiessen presented the panel on an update for this task. She noted that the substances under study include asbestos, arsenic, hexavalent chromium, lead, neptunium-237, plutonium-239, tritium released from Y-12 and classified materials. She said contaminants for which some information is classified include niobium, zirconium, tellurium, rubidium and boron. She said also that there is one substance whose presence is classified.

Dr. Thiessen said the task team studied an inhalation scenario for airborne releases and a drinking water scenario for waterborne releases. She said that a classified document will be produced for the task, and if substances are found to be of significant concern, steps will be taken to have information declassified.

Discussing asbestos, she noted that no specific incidents causing off-site exposure have been found.

Discussing arsenic, she said the focus will be on coal use for power at Y-12 and K-25.

She noted that hexavalent chromium was used at cooling towers at all of the sites, but most was used at K-25. She said hexavalent chromium will be analyzed as a carcinogen through inhalation and as a non-carcinogen through water.

She said lead was used in the production of weapons parts at Y-12.

She said beryllium, too, was used in weapons parts at Y-12. She said the task team is using stack data and focusing on a receptor in Union Valley.

She said nickel was used in the gaseous diffusion barriers at K-25 and that the task team looked at air releases.

She said lithium was enriched at Y-12. Toxicity data on lithium is very limited, she said, with information related primarily to pharmaceutical uses of lithium.

She said the goal for the plutonium under study is to verify that it is overwhelmingly of the isotope plutonium-239. She said the task team verified that, in all cases, this isotope made up at least 99 percent of the plutonium.

She said neptunium-237 was studied from the use of recycled uranium at K-25 and Y-12. Technetium-99 was also related to recycled uranium.

She said the tritium investigation focuses on Y-12, with tritium from X-10 included in Task 4. She said tritium was contained in heavy water sent to Y-12 for processing into deuterium gas. She said the amount is classified.

Dr. Thiessen said screening calculations should be done over the next several weeks and ready by the July meeting.

Ms. Sandra Reid asked why tritium data is still classified. Mr. Steve Wylie, a Y-12 employee of Lockheed Martin, said he would find an answer that is unclassified. The likely answer, he said, is that people might use tritium levels to estimate weapons-related production at Y-12.

Mr. Voillequé asked when a Task 7 report would be available. Ms. Cockroft said it is scheduled to be ready July 10. In response to a comment from Dr. Hamilton, the task team agreed to provide the panel with individual sections of the Task 7 report as they become available.

Mr. Lipford said he is concerned by the possibility that the Health Study's final report will be tainted by the fact that some parts would be classified. If a substance may have caused an adverse health impact, he said, it is important that that information be declassified.

PRESENTATION ON TASK 1

Dr. Hoffman noted that it has been one year since the first results of this task, focusing on iodine-131 releases from X-10 related to the processing of radioactive lanthanum (RaLa) from irradiated nuclear reactor fuel, were released. He said that report focused on receptors up and down Bethel Valley at 4 kilometers and 20 kilometers.

He said further goals of the study were to look at off-normal releases of iodine-131 and to extend risk estimates to adjacent valleys and different distances from the release point.

Mr. Widner said a lot of information was available from operations logbooks and that the task team is confident the logbooks are truthful. He said there were from seven to 125 dissolving events in a given year. He said the process had more runs in its early years because fuel slugs from X-10 had a relatively low RaLa content. The number of runs went down when it used fuel slugs from reactors at the Hanford Reservation.

Mr. Widner said off-normal events included an accident in 1954 in which fuel slugs were allowed to get hot and reacted when dissolving acid was poured in.

Mr. Widner said the task team is refining calculations of the inventory used in the RaLa runs. He said the study's first iteration used data from 1947 to represent other years as well. In the meantime, he said, the task team obtained data from all of the runs.

Mr. Widner said the iodine-131 content was about 4.8 curies per slug for the X-10 slugs. He said the 4-inch Hanford slugs contained 50 to 80 curies and the 8-inch Hanford slugs contained 200 to 300 curies.

Dr. Hoffman told the panel that, instead of annual release estimates, the task will make hourly estimates.

Dr. Shyam Nair of SENES Oak Ridge discussed atmospheric modeling for the task. He said the task began with annual release averages but has since been able to look at shorter periods of time and at off-normal releases. The task will be able to look at releases in all directions, he said. It will use hourly meteorological data, using actual data for some off-normal events and data from 1987 through 1994 for others.

Dr. Nair said air flow is largely controlled by the region's valley and ridge topography. He noted that X-10 is in Bethel Valley, with Haw Ridge on one side and Chestnut Ridge on the other. Ridges are about 100 meters high, he said, and the stack at X-10 is 60 meters high. He said gaps in the ridges generally do not allow flow between valleys. Instead, he said, transfer occurs during calm conditions.

Dr. Zawia noted that questions of transfer between valleys is especially important at Y-12 because of its proximity to the Scarboro community.

Dr. Hamilton asked how the task team is modeling for increased humidity at the Clinch River. Dr. Nair said the task team is considering that issue.

Ms. Reid asked about the effect of the releases on more distant areas. Dr. Hoffman said the capability of the modeling is limited in this regard.

Dr. Hamilton asked about iodine-131 releases from nuclear weapons tests in Nevada and specifically whether those releases are greater than releases from X-10 at distances as far away as Knoxville. Dr. Hoffman agreed, noting that iodine-131 exposures from the weapons testing are greater beyond 20 kilometers from X-10. He added that the X-10 releases add an incremental effect.

Dr. Zawia asked if transport and disposition patterns differ depending on the substance under study. Dr. Nair said transport patterns do not differ, but disposition patterns do.

TASK4PRESENTATION

Mr. Widner told the panel eight radionuclides had been modeled in Task 4. These included cesium, strontium, ruthenium, cobalt, zirconium, rubidium, zirconium, niobium and cerium. For the source term, he said, the task team converted annual releases to daily estimates.

He said that, when possible, the team adjusted the model to existing environmental data; this applied to strontium, cobalt, rubidium and cesium. For other radionuclides, little environmental data was available and the team matched the model to data in the literature.

Ms. Jana Hammonds of SENES Oak Ridge presented preliminary risk estimates for fish and drinking water pathways. For the fish pathway, four radionuclides were of interest: ruthenium, strontium, cobalt and cesium.

She said data from the 1960s was used to calibrate data at Clinch River Mile 14, near the K-25 water update, and at Clinch River Mile 3.5, near the Kingston Steam Plant. She said these data indicate the model underpredicted for all four of these radionuclides.

Ms. Hammonds explained transfer of contaminants in the food chain, noting that the task team looked at fish and water samples from different places and times and examined a variety of fish. She said they found that a species-specific factor was not needed. She said cesium had the highest uptake into fish and fish flesh, while strontium takes up more in the bone.

She said that for human exposures, the task looked at two receptors: an avid fisherman and a more typical fisherman. She said the team used a dose conversion factor to get absorbed doses and a dose-response conversion to estimate excess lifetime cancer risk.

Ms. Hammonds said that for an avid fisherman near Jones Island, the total dose had an upper confidence limit of 2 to 3 rads. The highest risk presented by these contaminants was for breast cancer, which was slightly greater than 10^{-4} for all radionuclides. She said the cancer risk was dominated by cesium, which had a similar spread of doses to each organ because cesium travels throughout the body.

Dr. Hamilton said it is important to show gender-specific risk, because breast cancer dominates the total risk.

Ms. Reid noted that pollution in Tennessee is very high and asked why Tennessee was used for background risk estimates. Ms. Hammonds said this is because Tennessee is the area under study.

Ms. Hammonds said the team compared fish in the Clinch River with those in the Columbia River, downstream from the Hanford Reservation. She said levels in the Columbia River were higher, and that there were different radionuclides of concern between the two.

Ms. Hammonds said that for drinking water, the radionuclides of concern were cesium, strontium, iodine and ruthenium. She said this pathway did not include a food chain factor, but it did include a filtration factor for the Kingston water supply, the Kingston Steam Plant and the K-25 water intake. She said cesium and strontium were mostly filtered out, but iodine and ruthenium tended to stay in the water because they don't bond to sediments.

Ms. Hammonds said the task team looked at risk to workers and adults from K-25 and the Kingston Steam Plant and at children and adults in Kingston. For the City of Kingston,

she said, the only source of contamination would be backflow from the Clinch River to the Tennessee River, because the water intake is on the Tennessee.

Ms. Hammonds said the highest risks from this pathway are driven by ruthenium. They are colon cancer, leukemia, breast cancer and liver cancer. She said that for iodine, the team looked at a female child born in 1955, when the city's water intake was installed.

Mr. Lipford asked how far up the Tennessee River the Kingston water intake is. Ms. Hammonds said she was not certain; the team was still working on data concerning backup to the water intake. She said the team knows that there was backup, but they're verifying how much.

Dr. Peelle said he would have thought iodine exposure was less than indicated because of its short half-life. Dr. Hoffman said the team has found no record of anyone using the Clinch River for drinking water before 1955. If there were such records, he said, the estimated risk from iodine would have been much higher.

Ms. Hammonds said the task team has contacted residents regarding issues of demography and land use. They are also looking at contamination of well water and groundwater; if this is confirmed, she said, the team will redo calculations for the drinking water pathway. She said work remaining in the task includes a look at external exposure to the shoreline, consumption of milk and beef and use of well water.

TSCA/K25 PRESENTATION

Mr. Earl Leming, director of the Tennessee Department of Environment and Conservation (TDEC) DOE Oversight Division, spoke to the panel about issue surrounding K-25 and the Toxic Substances Control Act (TSCA) Incinerator located at K-25. He noted that his division is responsible for state activities in cleanup under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as well as for oversight and management activities. He invited ORHASP to provide input into the direction taken by the Governor's Panel studying the TSCA Incinerator.

Mr. Leming told the panel that in March 1998, the governor directed state agencies to do a number of things:

- TDEC was directed to begin developing best available technologies to monitor emissions;
- TDEC was to consider denying renewal of permits for facilities unless the permits include monitoring provisions that use best available technologies;
- TDH was to look into the need for additional worker studies;
- The Tennessee Emergency Management Agency (TEMA) was to review the possible need for new regulations on the transportation of materials to and from TSCA.

Mr. Leming said the governor's panel is reviewing operating procedures at TSCA; it is looking into the adequacy of monitoring stations and verifying the incinerator's waste acceptance criteria. It is also addressing public concerns.

Mr. Leming said a workshop is scheduled for June 17, noting that nearly all of the permits that relate to TSCA are being reviewed. He said this meeting will be the first of a number of public meetings that address permitting.

Mr. Leming said TDEC has put in an ambient air monitoring system, which has been at K-25 for a couple of months. He said the system looks primarily at metals, and TDEC will share data with the Health Study when it is available.

Mr. Leming answered questions from the panel and public.

PANEL ROUNDTABLE

Mr. Alexander asked what the panel's responsibility is regarding issues surrounding the TSCA Incinerator. Mr. Voillequé said the presentation on TSCA was an information item. Mr. Alexander noted that the Health Study includes TSCA in its approach. Mr. Hutchison said the Health Study has not analyzed any facility in general, but has instead looked at specific contaminants.

Mr. Hutchison said the panel has not addressed the Blockhouse Valley Landfill or the Midtown Landfill, where there is concern that waste was brought from the Oak Ridge Reservation. He said the Health Study final report needs to note that it did not look into waste transported off the Reservation.

Dr. Erwin said people will want to know if the Health Study found a red flag in terms of the health of local populations. He said that question spurred the study in the first place and suggested TDH take information on the health of local populations and include it in the report.

Dr. Hamilton said he had not received a response to his comments on the Task 6 uranium report. He said he wanted to see the basis for a relative excess risk factor. Dr. Hamilton said also that he would not like to see preliminary reports released to the press. He said such a release does not do a service to the public.

Ms. Holloway said TDEC is looking for contributions from the Reservation to the Blockhouse Valley Landfill.

Dr. Peelle noted that the Health Study has gone through a change of leadership, with Mr. Lipford replacing Ms. Bashor as Project Director. Dr. Peelle said the Health Study needed to be careful to avoid resulting problems.

Ms. Brooks said she and DOE need information regarding what the state will need in terms additional grant money to complete the Health Study.

Dr. Zawia thanked Ms. Bashor for her leadership. Dr. Hamilton offered a motion commending Ms. Bashor for her leadership, and panel members passed this motion unanimously.

Dr. Zawia requested that the Scarboro community be included in the report for the uranium and mercury studies. Panel members agreed.

The panel adjourned.

MAY 23, 1997

Panel members present
Mr. Paul Voillequé
Dr. Joseph Hamilton
Ms. Barbara Brooks

Mr. Ralph Hutchison
Dr. James Smith
Mr. James Alexander
Ms. Norma Morin
Dr. Robert Peelle
Ms. Jacqueline Holloway
Mr. Patrick Lipford

Contractors present
Mr. Tom Widner (Project Director, McLaren Hart/ChemRisk)
Dr. Kathleen Thiessen (SENES Oak Ridge)
Dr. Joe Shonka (SRA)

TDH Staff present
Ms. Bonnie Bashor
Mr. Patrick Turri

Mr. Voillequé opened the meeting at 8:30 a.m.

Mr. Lipford noted that the next meeting will be July 16 and 17, a Wednesday and Thursday.

PANEL DISCUSSION — Scarboro community

Mr. Lipford noted that Scarboro is a community that feels it has been ignored in the past. Mr. Alexander noted that residents of the community, who are overwhelmingly African-American, had no choice but to live there in the early days of Oak Ridge. Dr. Hamilton said Scarboro should be evaluated as well as possible, but that the panel cannot predict what it will recommend for the community until after results are available. Mr. Hutchison said he would be uncomfortable with any follow-up in the community in which residents did not participate in that study.

Mr. Widner said the health Study needs to identify areas in Scarboro that need to be assessed and that they need to be identified quickly.

Dr. Smith asked if the Health Study had held a meeting in Scarboro (it had) and asked if it should sponsor another. Mr. Hutchison said ORHASP would have to devise an approach that overcame barriers in the community, such as fear of reprisals from DOE and its contractors.

Ms. Holloway said she believes another meeting in Scarboro is a good idea and agreed the panel would have to approach it differently. Mr. Hutchison suggested the panel speak with community organizers.

Dr. Smith suggested Ms. Holloway and Dr. Nasser coordinate the panel's approach to the community.

Dr. Hamilton objected to the meeting being held before the panel has more information. Dr. Erwin asked when the Task 6 (uranium) report would be revised. Mr. Widner said it would be at least a month before the task team gets a handle on monitoring data for the Scarboro community and Bear Creek Valley.

Dr. Zawia suggested a meeting with the community be held in September.

TASK 3 UPDATE

Mr. Widner said the Task 3 (PCB) report is being finalized and a draft should be available within the next couple of weeks. He said the PCB task differs from others in that no attempt was made to identify the source term. The model does, however, discuss sources on the Oak Ridge Reservation versus offsite sources.

Mr. Widner said the task team will recommend that more studies be undertaken of anglers and that anglers be the focus of a survey of PCB blood levels relative to fish consumption. He said the team will also recommend additional study of sediments in the Clinch River and Watts Bar Reservoir and that PCB sources be identified above Melton Hill Dam. He said more study also needs to be done of PCBs as a non-cancer risk.

Dr. Gawarecki suggested that the team look at PCBs in Fort Loudon lake.

TASK 5 UPDATE

Mr. Widner said there are now a total of 3,300 entries in the database for Task 5 (systematic document search). Searches of repositories included high-priority classified repositories at X-10, the National Archive and the Federal Records Center in Atlanta, high-priority unclassified repositories and low-priority repositories.

TASK 6 UPDATE

Mr. Widner said the task team is looking at environmental air monitoring data for Task 6 (uranium) and is also looking at topography in the area. He said sample data for the Scarboro community is available for 1985 through 1996.

SUBCOMMITTEE REPORTS

The panel met in subcommittees. Mr. Lipford noted that he had asked the Communications and Quality Assurance subcommittees to join the Health Effects Subcommittee.

Dr. Erwin presented the Health Effects Subcommittee report. He discussed a four-page document produced by ATSDR on mercury and PCBs. He said it is important to pull together information on health data in the area. Dr. Erwin noted that in march, the Health Effects Subcommittee posed three questions:

1. Of the radionuclides and chemicals, which are the most important current health concerns?
2. Could these be measured in the population relatively simply?
3. What body functions are affected?

Dr. Erwin said ATSDR is beginning to address current exposure potential, focusing on heavy consumers of fish.

Mr. Voillequé gave the report for the Dose Reconstruction Subcommittee. He said the committee discussed working to ascertain the connection between Y-12 and the Scarboro community. He said the subcommittee looked at monitoring information and maps and that it seems likely that concentrations from 1985 to 1989 or 1991 should be high enough to give useable data. He said data shows a decline in time that corresponds to a decline in the source term. He said the subcommittee talked briefly about volatilization of mercury from East Fork Poplar Creek.

CLOSE

Ms. Morin asked about the July meeting in Nashville. Mr. Lipford said the initial purpose of the meeting was to introduce TDH's new commissioner, Nancy Menke, to the panel and to present her with an introduction to the Health Study.

The panel concluded the meeting.

OAK RIDGE HEALTH AGREEMENT STEERING PANEL
MINUTES FROM July 16-17, 1997, MEETING
HOLIDAY INN SELECT
NASHVILLE, TENNESSEE

Members Present:

Mr. Paul Voillequé
Dr. Robert Peelle
Dr. Paul Erwin
Ms. Jacqueline Holloway
Ms. Barbara Brooks
Mr. Patrick Lipford
Mr. James Alexander
Dr. Nasser Zawia
Dr. James Smith
Ms. Norma Morin

Contractors present:

Mr. Tom Widner (Project Director, McLaren Hart/ChemRisk)
Dr. Owen Hoffman (SENES Oak Ridge)
Mr. Jack Buddenbaum (McLaren Hart/ChemRisk)
Ms. Susan Flack (McLaren Hart/ChemRisk)

TDH staff present

Ms. Bonnie Bashor

Mr. Voillequé opened the meeting on July 16.

PRESENTATION

The meeting began with a presentation on the Health Study to Tennessee Commissioner of Health Nancy Menke. Mr. Widner reviewed the history and variety of operations on the Oak Ridge Reservation, the Phase I feasibility study and the Phase II dose reconstructions and other work.

Ms. Menke asked when the report will be final and in language understandable to the public. Mr. Widner said two draft reports had been issued and he hoped to hand out two more the following day. He said the reports will have a two-month comment period. Mr. Widner said a draft overall summary should be ready around September and should be finalized by the end of the year.

Dr. Smith asked about the summary for the lay public, and Mr. Widner said that report would be in lay terms. Mr. Voillequé said the task reports will be technical and the overall report will be understandable to a wider public. He said the panel may write the report.

Mr. Widner said the report also needs to address the combined effect of contaminants. Mr. Voillequé said the Scarboro community will be a major focus for multiple contaminants.

Ms. Menke asked if any of the tasks will require more research. Mr. Widner said some of the task reports will address logical next steps. He said others will suggest that doses are low enough to indicate no further study is needed.

Dr. Erwin noted that the Agency for Toxic Substances and Disease Registry (ATSDR) has just begun an initial exposure investigation to PCBs and mercury at Watts Bar Reservoir.

Dr. Smith said another issue will be raised: Given the doses, what follow-up is warranted? He said possibilities include epidemiological studies and medical monitoring.

Ms. Menke said it seems the panel will not be in a position to prove or disprove health concerns. Mr. Voilleque said a complicating factor is that some of these exposures were a long time ago. He said concerns over radioactive iodine and the feasibility of an epidemiological study are important throughout the country. He said ATSDR is looking into medical monitoring at the Hanford Reservation and the National Cancer Institute is looking at iodine-131 from nuclear weapons testing fallout.

Dr. Hoffman said the Oak Ridge study is one of the first to address local releases of iodine 131 versus fallout from weapons testing in Nevada.

Dr. Zawia noted that although the Health Study is looking at historical releases, cancers may express themselves now.

Ms. Menke said the question people have is, "Was I exposed in a way that affects me and my children." Dr. Hoffman said that if you were living in the region, chances are you were exposed. He said it is difficult to say if you were likely harmed. Mr. Voillequé said the Health Study is looking at the possibility of making links between facilities and existing diseases.

At the end of the session, Mr. Lipford said he was pleased the commissioner could attend. He said Ms. Menke had good questions and the Health Study should work toward coming up with good answers.

Mr. Lipford said he had hoped to give a budget briefing, but he did not yet have all the necessary information.

DISCUSSION ON END-OF-STUDY PLANNING

Mr. Lipford said the purpose of the remainder of the meeting is to hash out unresolved issues.

Mr. Voillequé suggested possible topics for conversation:

- If the study identifies a risk to the population, what will the panel recommend?
- What will the panel recommend for people exposed to multiple contaminants?
- What will the panel recommend for follow-up, especially in Task 6 and Task 7.
- Should the panel prepare its own report?
- What will the Health Effects Subcommittee recommend for future studies?

Dr. Smith said the panel should also discuss public outreach at the end of the study. He said that at the Centers for Disease Control and Prevention (CDC), this requires a three- to six-month planning process. Ms. Morin offered to share her experience working with Rocky Flats, and Dr. Smith offered to share his experience working with Fernald.

Dr. Zawia said the panel should have a final report.

Ms. Morin discussed an outline for an end-of-study panel report. It would include findings; points of reference and an explanation of technical terms and issues, a validation of the scientific findings, with a discussion of such things as technical review by panel

members and outside experts and attempts to get information declassified; relevance and value of the study; and new science produced by the study. She said she believes panel members should comment on the process and findings.

Dr. Peelle said the panel should address the question, "What did we learn?" Dr. Erwin asked if the lessons are technical or procedural, and Ms. Morin said they are both. Dr. Smith said this step is important because a lot of people don't believe these studies are worthwhile.

Dr. Hoffman noted that the Oak Ridge study is perhaps the first to emphasize preliminary results. He said also that the study is unique in that it has been reasonably successful in stating its decision criteria.

Dr. Zawia suggested that the report leave room for dissenting opinions. Dr. Smith said the study's credibility would suffer from dissension and suggested that the panel work toward a consensus. Dr. Zawia said he was not suggesting a separate minority report, but that any disagreements that remain at the end of the study should be explained in the report.

Ms. Morin raised the question of end-of-study logistics. She suggested that preliminary results would be released before the November meeting, with the November meeting being for final results. She said the March meeting will give the panel a chance to discuss results presented in the November meeting.

Mr. Voillequé said the draft final reports are expected in September. Ms. Morin suggested deciding on a final meeting date and working backward.

Mr. Lipford said the panel had decided the March 1998 meeting would be the last one. He said the state based the budget extension on a March 1998 meeting. If the panel goes to a May 1998 meeting, he said, the Health Study has a budget problem.

Mr. Voillequé said the final reports for Task 2 and Task 3 should be ready this week. Mr. Widner estimated the Task 4 report would be ready in August and the Task 1 report in October. Dr. Hoffman told the panel that SENES Oak Ridge had run out of hours for the project.

Mr. Widner estimated drafts of the Task 7 studies would be available in two weeks and the Task 6 report would be ready in November. He said he is shooting for an outline of the final report by September, with a draft in November.

Dr. Peelle asked if there would be more impact with the results or with the final report. Ms. Morin said the big impact would be the results, not what panel members think about the results.

Dr. Smith said the Hanford study made a mistake. It did not have a final report, but rather had a collection of reports. At Oak Ridge, he said, the panel is talking about a panel report, an overall report and seven task reports. He asked what, exactly, is being referred to as the final report.

Mr. Lipford said that in Phase I, there were four books plus a fifth book that served as a summary. Dr. Smith said the Health Study has two competing reports, one from the panel and one from ChemRisk.

Dr. Erwin said it is unlikely ChemRisk will have an overall report for presentation in November. He said the panel would buy time by presenting the two reports together in March.

Mr. Voillequé said that by the November meeting, the panel should have the bottom line for the final reports.

Ms. Morin said calls from the media to officials will happen when the draft reports are presented, not when a ceremony is held.

Dr. Erwin said it appears the March meeting will be the more likely release of final results, not a business meeting. Dr. Smith said he foresees getting final results in January. Mr. Voillequé said that if Task 7 results indicate further dose reconstructions are warranted, more meetings will be necessary.

The panel took a break for lunch.

Mr. Lipford told the panel after lunch that DOE's Oak Ridge Operations (ORO) wants to retain a firm to review the final draft documents and are concerned that will be perceived as an attempt to control the studies and their outcome.

Mr. Tim Joseph from DOE said ORO would like to work with ChemRisk during development of the documents.

Dr. Peelle said the word "collaboration" should be avoided, but DOE is welcome to criticize public documents like anyone else.

Mr. Lipford said the state's position is that it has confidence in its contractors and that it is not appropriate to bring in another contractor to work with them.

Dr. Smith asked if the panel is confident with the number of reviewers it has. Ms. Bashor said two or more peer reviewers have been identified for each task.

Mr. Widner said he welcomes any comments but doesn't believe it is necessary to change the process.

Mr. Voillequé said TDH staff would look over the outside reviewers that have been identified for the tasks.

Dr. Peelle said the panel had not decided whether the final reports would be under one cover or two.

Ms. Morin said she is concerned that officials will get phone calls from the press and public before the studies are concluded.

Mr. Leo Williams asked to what extent the summary report will differ from the sum of the task reports. Dr. Peelle noted that it will address the question of multiple exposures. Mr. Williams noted that many of the results that will be contained in the final report have already been released in the draft reports.

Mr. Voillequé said a report has not been issued on the document search. Also the final report will tie together the site's history. Ms. Bashor noted that when someone calls the

commissioner's office regarding the Health Study, they are referred to state staff working on the study.

Mr. Voillequé said he would prepare an outline of the panel report by August and it could be discussed at the September meeting. Dr. Peelle said the panel will be doing very well if it has a rough draft in November.

Mr. Voillequé said a final version would be ready in February.

Mr. Joseph and Mr. Steve Wylie from the Y-12 Plant agreed to put together information on the declassification efforts.

Ms. Morin asked about a final repository for the studies. Mr. Lipford said the state is going to negotiate with three public libraries to provide them with resources as incentive for keeping the materials. He said they have talked about a couple of places for a final repository and it will probably be at DOE. He said Pat Turri from TDH is working to get the information on CD-ROM.

Mr. Voillequé said he is concerned about using DOE as a final repository. Dr. Smith said he agreed in principal, but that they must find someone who has room for the documents. Mr. Lipford said TDH staff have not figured out how the state can take the materials. Mr. Alexander suggested the City of Oak Ridge may be willing to take them.

Dr. Hoffman noted that a memorandum of understanding between DOE and the Department of Health and Human Services (HHS) calls for all epidemiological and dose reconstruction studies to go through HHS. He said a final repository is an issue that will have to be worked out between CDC and the National Institute for Occupational Safety and Health in the long term. Dr. Smith said while that is true for the long term, CDC will not be prepared to accept all the Oak Ridge Health Study documents in March 1988.

Mr. Widner estimated the materials will fill 12 four-drawer file cabinets. Mr. Voillequé said DOE will have to keep documents that are classified.

Mr. Widner said some documents for which ChemRisk does not have copies will be important for future studies and need to be preserved. Mr. Lipford said DOE has a moratorium on the destruction of documents relevant to epidemiological studies but does not have a comparable rule for dose reconstruction studies. Ms. Brooks said that rule is being interpreted broadly.

Mr. Wylie offered to tag relevant documents if Mr. Widner provides a letter specifying which documents are important.

Dr. Peelle made a motion that the state send DOE a letter in the panel's name requesting that documents found to be significant be preserved. Mr. Alexander seconded the motion, and it passed unanimously. Mr. Joseph stressed that the letter should be specific about what the panel is requesting DOE to do.

The panel adjourned for a break.

Mr. Jack Buddenbaum of ChemRisk discussed air releases from Y-12 and their exposure to the Scarboro community. Mr. Voillequé noted that pulse releases could result in more transport over the ridge.

Dr. Peelle said that if stacks are above the level of air monitors, that could explain the greater-than-expected air flow over Pine Ridge to Scarboro. Mr. Buddenbaum said the stacks are not a ground level. Mr. Voillequé said they are not 2 1/2 times the height of the buildings, either, which is the height that would avoid downdraft caused by the buildings.

Mr. Buddenbaum said Idaho National Engineering Laboratory looked at the issue of pulse releases, and there is no unambiguous answer. Mr. Voillequé said some of the work depends on receiving funds from a grant extension. Mr. Buddenbaum noted that the person helping with this data may soon be laid off.

Mr. Widner said that for mercury, they are assuming 5 percent to 10 percent of the air releases go over the ridge to Scarboro. He said this is still far less than the amount of mercury volatilizing from East Fork Poplar Creek.

Mr. Voillequé, Dr. Peelle and Mr. Buddenbaum agreed to talk the following week regarding comments on the uranium report.

Mr. Buddenbaum discussed problems the task team is having getting access to data on disks that belonged to John Googin at Y-12.

Mr. Voillequé presented the list of outside reviewers. Dr. Erwin was concerned that reviewers not be weighted too heavily toward Oak Ridge.

The panel concluded for the day.

JULY 17, 1997

The meeting began with a discussion of the citizens' summary and panel report.

PANEL DISCUSSION, final reports

Dr. Smith asked if the panel wants to combine the citizens' summary and panel report. Dr. Erwin suggested it would be more logical to combine the panel report with ChemRisk's overview report.

Dr. Hoffman said the panel report must address the question of why we didn't just go out and look for disease in the population.

Dr. Hamilton said a member of Congress is not likely to read a report that is 50 pages long.

It was agreed that the Health Effects Subcommittee will look at possible epidemiological or medical efforts in the future, Mr. Voillequé will look at dose reconstruction, Mr. Alexander will look at quality assurance, Ms. Bashor will look at the peer review process, and Mr. Joseph will look at declassification issues. Dr. Smith suggested ChemRisk or SENES look at lessons learned regarding the science of the Health Study.

Dr. Hamilton suggested the report contain a listing of every meeting held and who the outside speakers were.

PANEL DISCUSSION, all tasks

Mr. Lipford asked when information would be available to the public regarding classified materials. Mr. Widner said draft write-ups would be available in the next couple of weeks.

Dr. Smith asked if any of the classified materials were meeting the criteria for further study, and Mr. Widner said none were.

Mr. Joseph asked if he should provide a location for Q-cleared panel members to meet regarding classified materials, and Mr. Widner said he should. The meeting will be on the morning of Sept. 24.

Dr. Smith asked if the panel should ask that materials be declassified even if they do not pose a significant health risk, and Mr. Voillequé said that would be inappropriate.

Dr. Erwin said it makes him uncomfortable that non-cleared panel members are one more step removed from the process.

TASK UPDATES

Mr. Widner said the Task 2 team is looking at the variability of mercury in soil and incorporating Scarboro as a reference population.

Dr. Hoffman discussed Task 4, noting that many issues were raised at the presentation. These including the amount of backflow to the Kingston city water supply, the use of relative versus absolute risk. He said uncertainties in the task are very large. He said the prime pathways under consideration are cesium doses from fish and iodine-131 doses to children.

Dr. Smith said the Health Effects Subcommittee discussed future epidemiological or medical monitoring. Dr. Hoffman suggested the panel invite Dr. Bob Splangler with ATSDR, who worked on medical monitoring at Hanford.

Dr. Erwin asked if the panel can tell physicians to keep an eye out for certain problems. Dr. Zawia said the panel can ask physicians to keep an eye out for a pattern among their patients and to keep an eye out for the known effects of contaminants under study.

Dr. Smith said that, if the study shows significant exposures, ATSDR is mandated to do a medical monitoring study. He said the state should consider whether it would make sense to take measures ATSDR is required to take anyway.

The panel discussed lessons learned from the Health Study. Ms. Morin reviewed the process for Rocky Flats and suggested things to put in a similar document for Oak Ridge.

The panel reviewed scenarios they're focusing on. These included:

- An East Fork Poplar Creek farm family, both adults and children, exposed to mercury and PCBs.
- A resident of Union Valley, downwind of Y-12, exposed to uranium through the air.
- Residents of the Scarboro community, adults and children, exposed to mercury and uranium.
- Children attending Robertsville Junior High School, which borders East Fork Poplar Creek.
- Oak Ridge "community receptors 1 and 2," north of Oak Ridge Turnpike, who received more typical mercury exposures.
- Children living in Bethel Valley for exposure to iodine-131.
- People consuming fish from the Clinch River and East Fork Poplar Creek.

Mr. Widner said the Task 2 reports did not arrive, so they will be sent to panel members. Mr. Lipford emphasized that panel members should receive the report as soon as possible.

Mr. Voillequé emphasized that the panel would be receiving many reports in the near future. He said it is important for all panel members to review at least the executive summary, even if they feel unqualified to review technical details.

Mr. Lipford said he hopes reviews and responses to the reports can be completed within 60 days.

Ms. Brooks asked Ms. Morin to review public outreach efforts for the Rocky Flats risk communication. Ms. Morin said there were five focus groups: three contacted by random telephone dialing, one made up of activities and one made up of the Rocky Flats Citizen Advisory Board. Ms. Morin said the groups were asked how they would like to see risks presented.

Ms. Brooks suggested the Oak Ridge Health Study use the Rocky Flats experience. She said the public will not be interested in doses; instead they will be interested in risk.

Ms. Morin said the focus groups in Rocky Flats were videotaped, and she offered to share those tapes with the Oak Ridge study.

Dr. Hamilton asked if the panel should ask people in Oak Ridge how they would like to see risk presented. Ms. Morin said participants in the Rocky Flats focus groups are receiving \$25 or \$30 for a two-hour session. She said the groups contain 32 to 40 people, and participants were screened as to their knowledge of Rocky Flats operations and issues.

Dr. Smith volunteered to bring graphic materials used at Fernald as an example.

The panel adjourned.

OAK RIDGE HEALTH AGREEMENT STEERING PANEL
DRAFT MINUTES FROM SEPTEMBER 24 - 26, 1997 MEETING
OAK RIDGE MALL MEETING ROOM
OAK RIDGE, TENNESSEE

Members Present:

Mr. James Alexander	Mr. Ralph Hutchison
Mr. Patrick Lipford	Dr. Norma Morin *
Ms. Barbara Brooks	Dr. Robert Peelle
Dr. Paul Erwin	Dr. James Smith *
Mr. Paul Voillequé	Dr. Nasser Zawia
Ms. Jacqueline Holloway	

Members Absent: Dr. Joe Hamilton

Contractors Present:

Dr. Gordon Blaylock	Mr. Young Moon
Ms. Susan Flack	Dr. Joe Shonka *
Dr. Owen Hoffman	Dr. Kathleen Thiessen
Ms. Jennifer Cockroft	Mr. Tom Widner

TDH Staff Present:

Ms. Bonnie Bashor
Mr. Pat Turri

* Attended September 25, 26

Wednesday September 24, 1997

I. OPENING BUSINESS

Mr. Paul Voillequé, Chairman, opened the meeting of the Oak Ridge Health Agreement Steering Panel (ORHASP) at 1:00 p.m., Wednesday, September 24, in the meeting room of the Oak Ridge Mall. Mr. Voillequé welcomed everyone and asked all present to introduce themselves.

Mr. Voillequé invited comments and corrections to the final minutes from the March 1997 meeting. After a couple of errors were pointed out, Dr. Smith moved the minutes be approved as corrected. Ms. Holloway seconded the motion, and it passed unanimously.

Mr. Lipford reported that the request by the State for an extension of time and increased funding had been approved by DOE. The grant is now extended through March 1998, with an increase in funding of \$299, 724.

II. Phase II Goals and Objectives and Report on the Birth Defects and Cancer Registries

Mr. Pat Turri presented an overview of the goals and objectives that the panel developed in October 1993. The original newsprint sheets were displayed. The goals and objectives are as follows:

Goal I - Continue a comprehensive search of historical information related to the off-site release of the high-priority contaminants identified in Phase I. Also, continue gathering information on the off-site release of other substances through:

- record searches
- reviewing environmental sampling data, and
- interviewing past and present employees.

Goal II - Quantify historical iodine doses to the most highly exposed populations and estimate the range of doses to others exposed (this would also apply to cesium and other radionuclides released to White Oak Creek; mercury, and PCBs).

Goal III - Define criteria for continuing the dose reconstruction studies for each of the four primary materials. First, determine the level of contaminant that is of concern and define the maximum risk with doses of the most exposed population. Options for Goal III would be to :

- stop (if dose is sufficiently low or inadequate funding exists),
- continue forward with a comprehensive dose reconstruction, and
- complete a comprehensive epidemiologic study.

Goal IV - Based on the Vanderbilt Epidemiology Feasibility Study, determine if epidemiologic studies will be performed for the four contaminants of concern.

Goal V - Continue re-abstracting and case finding studies for the cancer registry and maintain the birth defects registry.

Goal VI - Ensure exchange of information and networking with the public.

Goal VII - Continue quality assurance of project activities.

Goal VIII - Review DOE's occupational medical program.

Goal IX - Continue the oversight role of the ORHASP.

Mr. Turri then presented a report on the birth defects and cancer registries. The birth defects registry is made up of reports of birth defects from various already existing sources of information, such as birth certificates, death certificates, hospital records. The coverage is state-wide and includes birth defects from birth to 1 year of age and fetal deaths. All cases were verified by a contractor to eliminate one person being counted twice and to eliminate problems that were not birth defects. Birth defects include congenital anomalies - ICD-9-CM 740-759, Sudden Infant Death Syndrome, Respiratory Distress Syndrome, Preterm/Low Birth Weight, Maternal complication of pregnancy (newborn affected by maternal complication of pregnancy).

For 1991, there 4870 infants and fetal deaths on the registry. After verification, there were 2344 infants and fetal deaths on the registry. Each case may have more than one birth defect recorded. DOE funding for this project has ended; however, the State is continuing the program.

The cancer registry began in 1986; the funding from DOE was for quality assurance activities of the registry. The DOE funding has ended, but the Department of Health has received funding from CDC to continue the registry and the quality assurance activities.

Ms. Sandra Reid and Ms. Jackie Kittrell brought up the issue of archives of various classified documents put together in Oak Ridge; some of the documents contain toxicology information. After asking some questions, Mr. Tim Joseph was able to identify the archive being discussed. ChemRisk's staff has thoroughly searched that archive.

III. Joint DOE/CDC Health Research Workshop or Oak Ridge Area

Ms. Barbara Brooks presented a summary of the purpose of the joint meeting to be held in Oak Ridge on October 30-31, 1997. At the meeting each recognized group working on health issues for the Oak Ridge area will present a brief summary of current activities and projects and an outline of future activities that will be needed. DOE/CDC wants broad input for research needs and priorities, not just for DOE and DHHS, for 1999 onward. Paul Seligman of DOE, Larry Elliot and his supervisor from NIOSH, and Jim Smith and someone else from CDC will be the hosts of the meeting.

IV. Report on August Meeting with Scarboro Area Community Leaders

Ms. Jackie Holloway gave an overview of meeting that she and Dr. Nasser Zawia had with community leaders in Scarboro. The meeting showed them that there was a great deal of interest in the Scarboro community about the dose reconstruction. They planned a public meeting at the Scarboro Community Center for 6:30 p.m. September 24, 1997.

This concluded the session of September 24, 1997.

Thursday, September 25, 1997

Members Present:

Mr. Paul Voillequé
Mr. James Alexander
Dr. Robert Peelle
Dr. Norma Morin

Ms. Jacqueline Holloway
Mr. Ralph Hutchinson
Dr. Nasser Zawia
Mr. Patrick Lipford

Dr. Paul Erwin
Dr. James Smith
Ms. Barbara Brooks

Members Absent:

Dr. Joseph Hamilton

V. Recap of the Community Meeting

Ms. Holloway said that she learned that all people want to know 'how the dose reconstruction is relevant to me'. Mr. Leo Williams said that people already know that contaminants were released to the community; therefor, communications should be geared toward, 'so what, what does it mean?'. Mr. Voillequé thought that the meetings may be better in a more informal setting with many resources available so that questions could be answered immediately. Mr. Joe Weaver reiterated that the meetings should be geared toward, what does it mean to me. Mr. Steve Wiley said that the presentation was too technical and needed to be more basic.

The consensus was that the meeting was a great success, with many people from Scarboro and other areas in attendance. We plan to have another meeting in Scarboro.

VI. Review of Results of Screening of Classified Materials for Task 7

Mr. Voillequé presented an overview of the meeting of Q-cleared staff, ORHASP members, ChemRisk staff, and DOE and LMES staff. The purpose of the meeting was to go over the details surrounding the screening of classified materials or materials with some classified aspect of their use.

1. Very small quantities of rubidium, yttrium, and boron were used in research. A cursory screening revealed that no risks to off-site populations were possible.
2. Niobium and zirconium were used in relatively large quantities. ChemRisk staff calculated a Reference Dose (RfD) type of number by dividing the animal LD50 by 100,000. This is a typical procedure used when there is no other toxicity data available (Layton DW, Mallon BJ, Rosenblatt DH, Small MJ. Deriving Allowable Daily Intakes for Systemic Toxicants Lacking Chronic Toxicity Data. Regulatory Toxicology and Pharmacology 7, 96-112 (1987)). The 'RfD' was used to calculate an 'allowable release quantity' for ingestion and inhalation pathways for the time period of use. The total amount used of niobium and zirconium were well below the 'allowable release quantity; therefor there is no feasible way there could be a risk to off-site populations.
3. One material is classified even to its name. It was handled in glove boxes with an inert atmosphere and recycling. There is no risk to people off-site. Dr. Smith suggested that we recommend that it should be looked at for worker exposure. Ms. Jennifer Cockcroft and Ms. Bonnie Bashor will discuss the issue and write a response to this question.
4. At the meeting there was a long discussion of the tritium issue. Tritium was received in Oak Ridge in heavy water from the Savannah River plant; tritium was a contaminant and was carried along with the deuterium from 1966 through about 1974. Some aspects of its use are classified, but we discovered that we may be able find out how much ^3H entered the Oak Ridge Reservation. The first level screening is marginal with respect to the ORHASP's guide value of a

one in ten thousand risk. The classified information revolves around the amount of deuterium in the heavy water; tritium was not monitored.

Ms. Reid asked if anybody had talked with K.Z. Morgan about his concern that the relative biological effectiveness (RBE) should be 2 to 3 instead of 1. ChemRisk staff have interviewed Dr. Morgan and are aware of his concern.

Ms. Cockroft will pursue the issue of the amount of tritium coming into the Oak Ridge Reservation.

We then adjourned so that the panel could attend the discussion by the Drs. Lockey, Bird, and Freeman at the Governor's Blue Ribbon Panel. The panel was created by Governor Sundquist to look into the TSCA incinerator at K-25 and its effect on people. Drs. Lockey, Bird, and Freeman were asked by DOE and LMES to examine the workers at K-25 who feel that they have been harmed by emissions from the incinerator to determine if their illnesses are related to exposures at work.

VII. Presentation on the Task 7 Draft Final Report

Dr. Kathy Thiessen presented an overview of the methodology for screening of materials. The goals of screening are to identify contaminants that are clearly below a level of concern with a level I screening and to identify contaminants that are clearly above a level of concern with a level II screening. The level I screening results in an over-estimate of risk for many individuals and is targeted at a reference 'most at-risk' individual. The level II screening results in a more realistic estimate of risk, but is still an overestimate of risk for some actual individuals and is targeted at a reference 'typically exposed' individual. The levels of concern (formerly called decision criteria, but now called guide values) are a one in ten thousand risk of excess cancer incidence or a hazard index (dose divided by RfD) of 1.0 for noncarcinogenic chemicals. Contaminants left over from Phase I are: asbestos, arsenic, chromium VI, neptunium-237, plutonium-239, tritium from Y-12, and other classified materials. Contaminants added in Phase II are: lead, beryllium, nickel, technetium-99, and lithium.

Ms. Cockroft presented results of the screening calculations. She informed the panel that screening for Scarboro was not included in her presentation. Screening for Scarboro would be done when the ridge effects for air flow from Y-12 over Pine Ridge into Scarboro were finalized.

Nickel

Nickel was not considered as a carcinogen in Phase I because it was not believed to be in a particulate size that could be inhaled. New information in Phase II indicated that nickel used at K-25 is respirable. Elemental nickel was used to produce the barrier; the peak years of use would have been the 1950s and the 1970s. No stack monitoring data for nickel was located. Outdoor airborne nickel concentrations ranged from less than 0.0018 to 10 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), at the K-25 monitor nearest the barrier building. The upper 95% confidence level of

nickel concentrations in surface water for 1975 data is 0.10 milligram per liter (mg/l). The highest mean concentration of nickel in sediment just upstream of the Clinch River-Poplar Creek confluence is 325 milligram per kilogram (mg/kg). These concentrations result in screening evaluation results as follows:

Level I:	1.8×10^{-5} cancer risk	Hazard index = 1.5
Level II:	1.7×10^{-6} cancer risk	Hazard index = 0.17

Ms. Reid questioned why we did not look at individuals in Kingston who had documented high blood levels of nickel. Ms. Cockroft indicated that concentrations that people could be exposed to would be higher at the location in the Greenview subdivision. Ms. Reid, also, wanted to know why fluoride was not included in screening because of its potentiation of toxicity of other substances.

Beryllium

In Phase II, the discovery of stack monitoring data for beryllium indicated that beryllium needed to be rescreened. Beryllium was used at Y-12, beginning in the early 1950s, in the production of a variety of weapons parts. Production methods included machining and drilling. The estimated down valley concentration used in screening was 8.2×10^{-9} $\mu\text{g}/\text{m}^3$. The maximum concentration of 2.0 $\mu\text{g}/\text{l}$ from East Fork Poplar Creek was used in the analysis, while a maximum concentration of 2.7 mg/kg in sediment from East Fork Poplar Creek was used. These concentrations result in screening evaluation results as follows:

Level I:	1.2×10^{-11} cancer risk for inhalation	5.4×10^{-4} cancer risk for ingestion
	Hazard index = 0.04	
Level II:	4.4×10^{-6} cancer risk for ingestion	Hazard index = 0.04

Lead

Lead was used at Y-12 from the 1940s until 1992 as a component of weapons. Production methods included vacuum casting, arc melting, powder compaction, rolling, forming, and machining. The estimated mean soil concentration along East Fork Poplar Creek is 196 mg/kg; the estimated water concentration in East Fork Poplar Creek used for screening purposes is 0.2 mg/l; the estimated air concentration used for screening purposes is 1.2 $\mu\text{g}/\text{m}^3$. Toxicity guidelines for lead are based on a blood level of 10 micrograms per deciliter ($\mu\text{g}/\text{dL}$). EPA's Integrated Exposure Uptake Biokinetic Model was used to estimate blood lead levels in children in a hypothetical East Fork Poplar Creek farm family during the 1960s. The estimated mean blood lead level was 13 $\mu\text{g}/\text{dL}$ for the hypothetical farm family and 16 $\mu\text{g}/\text{dL}$ in children eating a typical U.S. diet in the 1960s.

Hexavalent chromium

Hexavalent chromium (CrVI) was not screened in Phase I; this screening considered CrVI as used in cooling towers at K-25 and Y-12. By the 1970s CrVI was in use in some cooling towers at all three sites. The modeled CrVI concentration at the Grandcove receptor was 3.5×10^{-5} $\mu\text{g}/\text{m}^3$ when drift emission rates were calculated for periods of peak production. The maximum concentration of CrVI in East Fork Poplar Creek was 0.28 mg/l in the 1970s when blowdown

from the cooling towers became a concern. Measurement of CrVI in soil or sediment were not located. Generally CrVI reduces to trivalent chromium in soil; the maximum soil concentration for total chromium was 65 mg/kg. For screening purposes the 65 mg/kg was considered to be all CrVI. These concentrations result in screening evaluation results as follows:

Level I: 1.4×10^{-8} cancer risk for inhalation
Hazard index = 0.59 for ingestion.

Results for the Scarboro pathway have not been completed.

Neptunium-237

Neptunium-237 entered the K-25 and Y-12 sites as apart of uranium recycling programs, beginning in 1953. Y-12 received recycled uranium from Savannah River and ICPP; K-25 received recycled uranium from the Paducah Gaseous Diffusion Plant, Savannah River, and Hanford. It was sent to K-25 for enrichment and to Y-12 for weapons parts. The maximum concentration of neptunium-237 was 14 picocuries per kilogram (pCi/kg) due to the Y-12 plant and 18 pCi/kg due to the K-25 plant. For the Y-12 plant, releases were calculated based on total annual releases. For the K-25 plant, an annual average of 0.0015 curies (Ci) was used for all years of release. The air concentration used in this screening analysis was based on the uranium (task 6) unit air concentrations at the Grandcove (K-25) and down valley (Y-12) receptors.

These concentrations result in screening evaluation results as follows:

Level I: 2.1×10^{-5} cancer risk for K-25
 2.8×10^{-5} cancer risk for Y-12.

Results for the Scarboro pathway have not been completed.

Plutonium

Mr. Widner presented the results of the plutonium evaluation. In Phase I, plutonium was assumed to be present as plutonium-239. The ramifications of this assumption were evaluated in this evaluation. The results of this evaluation show that plutonium-239 comprised at 99.9% of total plutonium present. Plutonium-240 represents about 0.03 % of the plutonium. Plutonium does not require further evaluation.

Ms. Flack presented the results for arsenic, lithium, and asbestos.

Arsenic

Arsenic was released from the burning of coal at the K-701 powerhouse from 1944 through 1962 and from Y-12 Building 94401-3 steam plant from 1956 to the present. It was also released from the K-720 fly ash pile at K-25 and Roger's Quarry (Y-12). For Y-12, the maximum sediment and water concentrations were assumed to be in McCoy Branch (sediment was used as a surrogate for soil since no soil sample results were found. For K-25 the maximum sediment core data was at Poplar Creek mile 1.0 and the maximum water data was at Poplar Creek mile 0.3. The USEPA emission factor for arsenic released per Btu was used. The receptors for arsenic in air considered were at the Grand Cove subdivision and down valley; the Scarboro community will be incorporated in the screening. These concentrations result in screening evaluation results as follows:

Level II: 6×10^{-5} cancer risk for the K-25 powerhouse
Hazard Index = 0.9 for the K-25 powerhouse
 2×10^{-5} cancer risk for the Y-12 steam plant
Hazard Index = 0.2 for the Y-12 steam plant.

Arsenic does not require further evaluation.

Lithium Deuteride

The maximum usage of lithium hydroxide occurred from 1955 through 1958, with five to nine million pounds of feed per quarter. At first the production was very dusty, but later the production was modified to keep the dust down. The lithium was handled in dry boxes. Air concentrations were estimated from concentrations in building 9204-2 of $154 \mu\text{g}/\text{m}^3$ and a stack emission rate in building 9201-4 of 0.56 grams per second. The maximum water concentration in East Fork Poplar Creek was 17 parts per million in 1955; in 1965, 500 pounds of lithium hydroxide were lost in a spill, which would have entered the creek. A toxicity value was estimated from the maximum therapeutic dose of 4 milligram per kilogram per day. The level I screening resulted in the following hazard indices:

Ingestion = 0.8

Inhalation = 0.00002.

Lithium does not require further evaluation.

Asbestos:

No production uses of asbestos were identified. Land burial of asbestos-containing building materials occurred from 1950 through 1991. No historical monitoring of data of airborne asbestos concentrations were located, nor were any environmental sampling of interior or exterior environments conducted during the 1993 housing study. No further study appears to be warranted until evidence of off-site exposure can be demonstrated.

VIII. Presentation on the Task 6 Uranium Assessment

Mr. Jack Buddenbaum presented an update of work done on the uranium assessment since the first draft report. Comments on the draft final report indicated the need for more detail and that there is a fine line between the Task 6 screening and a detailed dose reconstruction. The final report will include Level II screening results. Revised estimates of K-25 air releases will use reported data from various reports, rather than statistical fitting to account for missing data. A correction factor of 4 for lines losses and 3 for alpha burial losses were used for Y-12 air release estimates.

Mr. Buddenbaum explained the variability of ratios of uranium-234, uranium-235, and uranium-238. The ration of uranium-234 to uranium-235 varied as a function of uranium-235 enrichment as a result of the gaseous diffusion process. The large variety of missions at Y-12 involved a wide range of uranium enrichments. There were many data gaps for various uranium operations at Y-12, and the information to support Y-12 estimates came from a variety of sources.

The Pine Ridge factor will be used to revise the Level I and II screenings; the revised results will be in the final report for task 6. The factor will be based on the ratio of environmental measurement within Bear Creek Valley and at Scarboro. The flat terrain ISC dispersion model overestimated the air concentrations in Scarboro and in other locations outside Bear Creek Valley.

Dr. John Googin's files are a potential source of useful information for health studies. He was a chemist at Y-12 for 50 years, involved with all facets of Y-12. He was interviewed three times by ChemRisk staff. Of the over 350 diskettes of his reviewed, 103 contain potentially relevant information; 38 of these are classified.

At 5:45 p.m. Dr. Smith moved that we adjourn at 6:00; Dr. Morin seconded the motion. Four members voted to adjourn, 1 voted not to adjourn, and 3 members abstained. The meeting adjourned at 6:00 p.m.

This concluded the session of September 25, 1997.

Friday, September 26, 1997

IX. Presentation on the Task 6 Uranium Assessment - Continuation

Mr. Widner continued the presentations with a summary of differences in modeling when using ridge effect factors. Ridge factors were evaluated for each uranium isotope; there were no Y-12 station air data for uranium-234 and uranium-238 after 1992; the 1990 uranium-235 values were below the detection limit. Air monitoring station 46 in Scarboro was used for air concentrations in Scarboro. There are 12 air monitoring stations at Y-12; ChemRisk used air concentrations averaged from stations 2 through 8 as a first step in estimating the ridge factor. Stations 2 through 7 are along the north boundary of Y-12 closest to Scarboro; station 8 is along the southwest boundary of Y-12. Conclusions of the ridge factor data analysis were: 1) the data is highly scattered and difficult to establish a valid distribution for statistical analysis; 2) level I value of 0.5 was reasonably high to avoid under-prediction; 3) level II value of 0.2 is reasonably conservative and likely not to over-predict. There was much discussion of the data and how to best use it. Mr. Buddenbaum will compile the data and prepare a written report to be sent to the panel members. Areas for future work cannot be done now, but the evidence indicates the need for a full dose reconstruction.

X. Report on Outline of Panel Report

Mr. Voillequé presented an outline of the "Report of the Oak Ridge Health Assessment Steering Panel". Several panel members had comments that resulted in discussion. Some of the suggestions are as follows:

- another title for the report
- a citizen summary

- a section on what the study was designed to do and what it did do
- a very short executive summary
- a section on what needs to be done in the future
- a section on what worked and what did not work.

XI. Report on Outline of Final Overview Report

Mr. Widner presented an outline of the proposed project summary report. There was a great deal of discussion on effects of multiple exposures. It was clear that we need a way for people to be able to find an estimate of their risk for where they lived and what they did at particular times. It was reiterated that the report needs to be fairly short (20-25 pages maximum).

XII. Subcommittee Reports

The Dose Reconstruction and the Health Effects subcommittees met. Members of other committees joined the subcommittee meeting they were most interested in.

A. Dose Reconstruction Subcommittee

B. Health Effects Subcommittee

Dr. Erwin gave the report for this subcommittee. It was a lively meeting with participation from many panel members, contractors, and the public. Mr. Pat Turri explained some problems he was having doing mortality and cancer morbidity statistics for the Scarboro area. Dr. Erwin had some suggestions which Mr. Turri will use in completing his analysis. Dr. Smith said that he would get Mr. Turri an address-matching database that would allow calculation of more reliable statistics. Ms. Bashor and Mr. Turri will work on methods for presentation of results to the public so that they can tell what their risks are from multiple exposure pathways and multiple chemicals and radionuclides. Ms. Bashor, Ms. Sandra Reid, and Ms. Holloway will interview 10 persons each to find exposure scenarios for real people; Ms. Bashor will get these scenarios to Mr. Widner so that he can incorporate their exposures and risks into the summary report. There are two questions that we need to have an answer for: 1) I lived here and did this; what is my risk of getting sick?, and 2) I'm sick; could exposures around ORR have caused it?.

XIII. OTHER PANEL BUSINESS

Dr. Peelle, Dr. Hoffman, and Mr. Voillequé discussed the use of means and medians in the reports. Dr. Peelle said that the mean should be used as the measure of central tendency; Dr. Hoffman said that the median is a better measure for uncertainty analysis; Mr. Voillequé said that the mean is more user friendly and with it we will be able to add up doses and risks for multiple exposures.

Dr. Peelle wants the reports to focus more on long term effects in the toxicology write-ups. We need to understand which effects go away when the exposure is over and which ones are permanent and can be cumulative over time.

Dr. Smith is uncomfortable with the use of ATSDR/EPA toxicology numbers; he thinks that their use is too close to regulatory issues. He also thinks that we are going too slowly and will not get finished. He had two suggestions: 1) be more careful about questions we ask, and 2) try not to say everything on the overheads.

There being no further business, Mr. Voillequé adjourned the meeting.

Attested to as the official record of business of the ORHASP by:

Mr. Paul G. Voillequé

Date

OAK RIDGE HEALTH AGREEMENT STEERING PANEL
MINUTES FROM November 19-21, 1997, MEETING
OAK RIDGE MALL

Members present:

Mr. Paul Voillequé
Mr. Patrick Lipford
Dr. James Smith
Mr. James Alexander
Ms. Barbara Brooks
Dr. Robert Peelle

Contractors present:

Mr. Tom Widner
Mr. Leo Williams

TDH staff present:

Mr. Patrick Turri

Mr. Lipford gave an update on status of the Health Studies. He said an offer by the Agency for Toxic Substances and Disease Registry (ATSDR) had been declined by the State. He said ATSDR had developed a more grandiose plan for review of the task studies than the State had envisioned. He said ATSDR may submit peer reviews by February. He noted that DOE has funds to secure outside reviewers and that Dr. Tim Joseph of DOE would speak to the panel the following morning.

Mr. Lipford said the draft final report for Task 1 is not available and would not be available for some time. He said the panel would not have a verbal report on Task 1, either.

Mr. Lipford said Mr. Widner has updated information on an accidental release from Radioactive Lanthanum (RaLa) processing at X-10 (Oak Ridge National Laboratory).

Mr. Lipford said the panel needed to discuss Task 1 issues and make a recommendation the following day. Dr. Peelle asked if Task 1 had been delayed indefinitely, and Mr. Lipford said that it had.

The panel reviewed minutes from the meetings of May, July and September, 1997, and approved them with revisions.

REVIEW PROCESS

Mr. Lipford said ATSDR has not advised the state what it plans to do to review the Health Studies. He noted that the documents are public and ATSDR is free to do an extensive review. He said if the ATSDR review is not done by the Health Studies deadline, it would not be included in the Health Studies final report.

Dr. Smith said it appears there has been a misunderstanding and that ATSDR seems to believe the State has made a formal request for it to organize a peer review of the studies and analyze their impact. Ms. Brooks said it appears ATSDR may have interpreted the request more broadly than was intended.

Mr. Jack Hanley of ATSDR told the panel his agency is moving as fast as it can to have the review completed. He said it did not appear ATSDR could have the review completed on the Health Studies' timetable. He said ATSDR intends to have external reviewers for all of the tasks except Task 5 and Task 7. Dr. Smith said the ATSDR plan appears unacceptable. He said ATSDR has worked out a process that competes with the panel process, and this will potentially have serious ramifications by creating a process parallel to the panel

process. He noted that DOE, which is providing funding for the studies, is also providing funding for a parallel process that can undermine the panel process.

Mr. Hanley said ATSDR had expected to have more time than will be available to do the review. He said ATSDR's goal is not to circumvent what the State is doing but to improve the final document.

Dr. Zawia said the timing for the discussion was disturbing. Mr. Hanley noted that previous dose reconstruction studies have typically fallen into two phases: the studies themselves and future activities. He pointed to Hanford as an example; the study was reviewed by the National Academy of Sciences and attempts are being made to get medical monitoring.

Ms. Holloway said the discussion brings up a credibility. She said average citizens have no trust in the Oak Ridge Health Studies, and for this conversation with ATSDR to arise so late in the process is a problem.

Mr. Hanley said ATSDR plans to have a scoping meeting and invite the state to participate. He said the meeting would allow commentators to discuss the tasks among themselves. He said ATSDR would love to have the task leaders present. Dr. Zawia said that process should be coordinated by the Steering Panel and not by ATSDR. Mr. Lipford said the State is confident that the panel and reviewers will find any deficiencies that may be in the final report. He said the process proposed by ATSDR can only do more harm than good.

Mr. Hanley said it would be possible for ATSDR to get involved only after the documents are final, but the agency does not want that. Dr. Smith said he wished the State had been more aggressive than ATSDR in getting funding. Mr. Hanley said ATSDR's position was that if DOE had more money, it should give that money to the state. Dr. Peelle suggested postponing the discussion until the panel had worked out other aspects of input into the studies.

DOE/CDC HEALTH MEETING

Ms. Brooks and Dr. Smith reported on the joint meeting in Oak Ridge sponsored by DOE and CDC. Ms. Brooks said the meeting was intended to come up with a more coherent public health agenda for DOE sites and to respond better to community and worker concerns. She said there were two breakout sessions led by facilitators: one was on community concerns, the other on worker concerns. Dr. Smith said CDC was pleased with the outcome of the meeting. He said it was unusual in that the agencies came primarily to listen. He said people attending the meeting were articulate as well as vocal. He said people attending the meeting wanted a range of things from the agencies: environmental health services and symptom surveys, examination of endpoints other than cancer, a focus on children, and an exploration of psycho-social issues. He said the community wants to engage the medical community on health issues in Oak Ridge. He said people want to do exposure surveys instead of just dose estimates, and they want to see a bias in favor of sick people. He said speakers at the meeting wanted to see the government get creative in solving complex problems.

Mr. Lipford asked if there would be a follow-up meeting in Oak Ridge. Dr. Smith said there would be, and discussions focused on when to hold it.

Dr. Peelle noted that there were criticisms of the Health Studies at the meeting. He said people felt the Steering Panel's job has been wasted. He said the Steering Panel needs to recognize that its focus is on public health and that some people are not impressed.

ADDITIONAL BUSINESS

Dr. Zawia asked why Task 1 had not been completed. Mr. Widner said that Task 4 was more complex than had been anticipated. He said that, in the best of all worlds, Dr. Hoffman would like two months to complete Task 1. Dr. Peelle asked about Task 4. Mr. Widner said results would be presented on Thursday and the report would be FedEx'd to Panel members the following Monday. Mr. Lipford said that if a draft for Task 1 is not available by Jan. 1, it will not be included in the final report.

Dr. Peelle said the Panel needs to plan for identifying problem comments. Mr. Voillequé asked if ChemRisk should come up with the list or if the Panel should. Mr. Widner said it would be best if both sides generated a list. Mr. Voillequé said that, under the current contract, March is the drop-dead deadline for ChemRisk. Dr. Smith said he'd hate to see the study fail for lack of a couple of months. He said that in this type of study, the need for an extension is the rule.

The Panel adjourned.

NOVEMBER 20

Panel members present:

Mr. Paul Voillequé
Mr. Patrick Lipford
Dr. Paul Erwin
Dr. Nasser Zawia
Ms. Barbara Brooks
Mr. James Alexander
Dr. Joseph Hamilton
Dr. James Smith
Dr. Robert Peelle

Contractors present:

Mr. Tom Widner
Dr. Kathleen Thiessen
Jana Hammonds
Mr. Leo Williams

TDH staff present:

Mr. Pat Turri

Mr. Voillequé opened the meeting with a discussion of the Health Studies schedule. Dr. Hamilton said there is no way the studies can conform to the deadlines that now exist.

Panel members noted that the Task 2 draft is completed and comments have been received from the Panel, the State, ATSDR and CDC. The Task 3 draft is done, and comments have been received from some Panel members and ATSDR. A draft for Task 4 will be available Nov. 25 and comments are due Jan. 1. The Task 6 draft is completed and the Panel will receive an addendum today.

Task 7 looks at nine substances and includes an unclassified report on classified substances. Comments on the first six substances were due Oct. 22. Task 7 comments on the unclassified report is due Dec. 31.

Mr. Lipford said March 31 is the day the lights go off. Dr. Hamilton said there's no way the health Studies can meet the deadline without engendering distrust of the process. Dr. Peelle said it's not a valid reason to extend the deadline just because the studies weren't completed. He suggested delaying the deadline to resolve comments but not the report deadline itself. Dr. Smith said he is uneasy with the contractor leaving March 31.

Dr. Peelle suggested the Task 1 draft deadline be set at Dec. 24. Dr. Thiessen said much of the report is written, and SENES is waiting on the source term.

Mr. Lipford said the external reviewers' contracts expire Dec. 31, the Steering Panel and ChemRisk contracts run through March 31, and the State process runs through June 6. Mr. Lipford asked, "When is enough enough?" Mr. Alexander said he did not believe March 31 is reasonable.

Dr. Hamilton noted that he had spent a lot of time on the studies, including late nights. He said "enough is enough" when he sees a document he can sign his name to.

Mr. Voillequé suggested the Task 1 draft be due Dec. 24 and comments be due by the Jan. 22-24 meeting

Dr. Peelle said that if the Health Studies puts out an incomplete report, it will hurt the reputation of all involved. Dr. Smith said it looks as though the Panel will refuse to sign off on a report that is incomplete. Mr. Turri said the extension of time is not the biggest problem; the extension of money is. Mr. Widner said it would be difficult to meet the deadline.

Mr. Lipford said he and Mr. Turri would lobby the State for an extension.

FINAL REPORT

Mr. Widner said a draft of the ChemRisk final report could be distributed in advance of the January meeting. Dr. Hamilton objected to getting a draft of the final report before he had received responses to comments on the draft task reports. Dr. Zawia agreed, saying the issues were not editorial, but were issues that could affect the Health Studies conclusions. Mr. Widner said ChemRisk will not issue a draft until it has discussed comments with each of the Panel members.

JANUARY MEETING

Mr. Lipford said the only meeting space available for the Jan. 23-24 meeting is at Oak Ridge Mall. After discussion, the Panel agreed the meeting would begin Thursday afternoon, Jan. 22, and conclude Saturday, Jan. 24.

REVIEWS

Mr. Hanley told the Panel that ATSDR will have external reviewers discuss each of the tasks publicly. Dr. Joseph said DOE is concerned, as Panel members are, about the Health Studies deadlines. He said DOE does not want to abandon good science in order to meet a deadline. He said the Health Studies reports will have a significant impact on what happens in Oak Ridge over the next decade.

Dr. Smith said the process proposed by ATSDR and DOE undermines the ORHASP process. Dr. Peelle moved that ORHASP advise TDH to contact ATSDR. TDH would tell ATSDR that technical comments are welcome, but the Panel cannot promise to respond to comments made after Jan. 1. He said a public forum to discuss the draft reports is inappropriate. Dr. Hamilton said that if a forum is to be held, it should be held by ORHASP. He suggested an amendment to Dr. Peelle's motion adding that ORHASP opposes an independent forum held by ATSDR.

After discussion, the Panel passed a motion that technical comments are welcome but any independent process or forum is inappropriate until after the final report is issued.

TIMELINE

The Panel discussed deadlines for the task reports as follows:

- Task 1 draft due Dec. 24, with comments due Jan. 31 (Jan. 20 would be even better)
- Task 2 draft has been completed and comments have been received
- Task 3 draft has been completed and comments are due Jan. 1
- Task 4 will be received Nov. 25, with comments due Jan. 1
- Task 6 draft has been completed and comments are due Dec. 10
- Task 7 addendum was received 20, and comments are due Dec. 10.

Jim Phelps, a member of the public, told Panel members that they need to draw hard lines with their contractors. Jack Buddenbaum of ChemRisk said air release estimates for K-25 and S-50 were revised downward 26 percent from the initial assessment.

The panel broke for lunch.

TASK 4

Ms. Hammonds reported on Task 4. She said the team used measurements for concentrations of cesium, strontium, cobalt ruthenium when these were available. Otherwise, they modeled the concentrations. Other substances included iodine, cerium, zirconium, and niobium. She said iodine was the only radionuclide for which the team modeled all years.

Ms. Hammonds said the study looked at five reaches of the Clinch River as locations of interest: Jones Island, Grassy Creek, K-25, the Kingston Steam Plant and the city of Kingston. Dr. Hamilton suggested that, for the number of people who were exposed, it would be worthwhile to break the exposures out into one or two typical years.

Ms. Hammonds of SENES Oak Ridge said fish ingestion dominated all risk scenarios. Dr. Hamilton suggested comparing the exposures with the Columbia River in Washington. He noted the Indians in that area relied on fish in their diet. Gordon Blalock of SENES noted that the radionuclides in the Columbia are different from those in the Clinch.

Dr. Smith asked why the team is doing dose reconstructions instead of simply measuring the radionuclides. Ms. Hammonds said measurements would tell only of recent exposures.

RALA ACCIDENT

Mr. Widner discussed a 1954 accident in ORNL's processing of radioactive lanthanum (RaLa), which led to a release of I-131 into the atmosphere. He said the run in question involved irradiated fuel slugs from Hanford, although it is unclear from which reactor at Hanford. On this day, 161 slugs of fuel had been loaded into the dissolver, and three dissolvings removed the equivalent of 18 slugs each. After the third dissolving, the slugs sat dry for about 28 hours and became thermally hot. When the dissolving solution was added to the slugs, there was a violent reaction, which forced solution through the slug loading chute. The building had to be evacuated.

Mr. Widner said the largest airborne release started at 5 p.m. He said reports indicate the releases lasted about two hours before the off-gas treatment system could regain control.

He said investigators have located meteorological data from that day, including wind direction and speed, atmospheric stability and precipitation.

Mr. Widner said each slug contained from 350 to 750 curies of I-131, depending on which Hanford reactor they had come from. He said one key assumption is how much of the released bypassed the caustic scrubber in the facility. He said that, in the first two hours, as much as 100 percent of the release bypassed the scrubber.

Mr. Widner said that, depending on the assumptions, the event has a potential for having released thousands of curies. Mr. Alexander asked how many curies were released, and Mr. Widner said investigators were not yet prepared to give a specific estimate.

Dr. Peelle said he was in the facility at the time. He said investigators should compare reports to his recollection of several elements of the event.

CROSS-VALLEY TRANSPORT OF CONTAMINANTS

Dr. Shyam Nair of SENES discussed the transportation of contaminants, iodine-131 in particular, between valleys. Dr. Zawia asked why graphs for monitoring data use the late 1960s. Dr. Nair said the only good monitoring data is from 1965-69.

The Panel Adjourned.

NOVEMBER 21

Panel members present

Mr. Paul Voillequé
Mr. Patrick Lipford
Ms. Jacqueline Holloway
Dr. Paul Erwin
Dr. Nasser Zawia
Mr. Ralph Hutchison
Mr. James Alexander
Dr. Joseph Hamilton
Dr. James Smith
Ms. Norma Morin

Contractors present

Mr. Tom Widner
Dr. Owen Hoffman
Dr. Shyam Nair
Mr. Jack Buddenbaum
Mr. Robert Burns
Mr. Leo Williams

TDH staff present

Mr. Patrick Turri

DISCUSSION

Dr. Hamilton expressed concern over the addendum to Task 6. He said there were discrepancies between monitoring numbers and the model. Mr. Voillequé said there were complicating factors in the task. Dr. Peelle suggested going back and working with the raw data. Dr. Zawia said the Health Studies must work with available data, even though it is imperfect. Dr. Hamilton said the uranium model data are four to 30 times higher than the monitored data. He said he doesn't know whether to believe the monitoring information from the Scarboro community. He said the data indicates something went from Y-12 to Scarboro, but beyond that, the information is in question.

Dr. Smith said the concern relates to a question he had for Ms. Hammonds regarding biological measurements. He noted that panel members work with data in their professional lives. He said investigators tend to rely on models and that they need to get all available data and explain discrepancies between the models and the measured data. Dr. Hamilton added that they need to check the models against available data.

Mr. Voillequé said he doesn't think it's feasible in the Task 6 screening to go back and review all of the source terms. Mr. Widner suggested coming up with a mathematical ratio between the source terms and the Scarboro monitoring data.

TASK 1 SCHEDULE

Dr. Hoffman told the panel that the source term is not completed for Task 1. He said he needs eight weeks from the time the source term is available to deliver a report he can stand behind, one that is comparable to other dose reconstructions. Mr. Lipford said it is clear the Panel won't have a draft final report on Task 1 in time to include it in the Phase 2 report. He said the panel needs to determine how to address the issue of having one component of the final report incomplete.

Dr. Zawia asked why Task 1 had fallen behind. Dr. Hoffman said that when the preliminary report was presented, investigators said they would improve the Task in several areas, the most important being in the source term. Dr. Smith said all the task's conclusions are based on the source term. He said the credibility of the study relies heavily on the source term. Mr. Lipford said that on Aug. 28, an agreement was reached under which the Task 1 final report would be available by Oct. 24. Dr. Hoffman said investigators had learned a lot since then.

Mr. Voillequé brought up the Panel meeting for Jan. 22-24. He said for all other tasks, comments should be turned in by Jan. 1. Dr. Peelle asked if investigators should use the old Task 1 source term numbers. Dr. Hoffman objected to going back to the old source term data. Mr. Hutchison asked what the options are. Mr. Lipford said it's tricky to extend contracts for the contractors, although it's not tricky to get more money or to extend contracts for the panel members.

Dr. Hamilton inquired about requesting a three-month extension, and Dr. Smith suggested a six-month extension. Dr. Hamilton moved that the panel request a six-month extension, with the final task reports to be finished in the first three months. Mr. Hutchison seconded the motion.

The panel agreed that the source term would be delivered for Task 1 by Nov. 28, with the draft final report due Jan. 31 and comments due by the March meeting.

Dr. Hamilton said he did not want to see risk numbers in the draft final report because they would likely be misrepresented by the news media. Mr. Hutchison said he would like to see all available numbers included in the draft report.

Mr. Hutchison asked if the panel should send a letter to Gov. Sundquist asking for a time extension for the studies. Mr. Lipford said he would prefer that he and Mr. Turri tackle the issue. Dr. Hamilton suggested that the panel focus on what Mr. Lipford asks of it. Mr. Alexander said he did not see how such a letter could hurt.

SCHEDULE

The panel reviewed its schedule for the remainder of the project. It agreed on the following schedule:

- Panel draft report: Partial report due March 31, full report due May 31.
- I-131 source term: Nov. 28
- Task 1 draft report: Jan. 31

- Panel meeting: Jan. 22 (resolve comments for tasks other than Task 1.)
- Task 1 review: Feb. 28
- Panel meeting: March 18
- Final reports (Tasks 2-7): March 18
- Summary report: May 31
- Task 1 final report: May 31
- Panel meeting: June 29-30 (Discuss major issues for panel)

The panel broke for lunch

After lunch, the panel subcommittees met.

Dr. Erwin reported for the Health Effects Subcommittee. He said five risk scenarios will be developed to illustrate exposures to real people. He said the goal is to be able to speak qualitatively — not just quantitatively — about the risks to real people. He said the subcommittee is proposing a community-based health assessment to provide the panel with a perspective on other health concerns in Anderson County. He noted that the state Commissioner of Health has asked the CDC to do an epidemiological study in the Scarboro community.

Mr. Hutchison reported for the public information subcommittee. He said Mr. Williams discussed a tabloid publication for the final communication. He mentioned challenges involved with getting adequate public attention for the final ORHASP meeting, key among them that much of the information in the final report will already be available to the public and that other health-related efforts will be competing for attention. He discussed the possibility of a poster display being set up in the American Museum of Science and Energy.

PANEL CONCERNS

Mr. Hutchison asked about the decision criteria used for Neptunium-237. He said it would be worthwhile to have a panel discussion on the issue. Mr. Hutchison also expressed concern over how the panel will report its recommendations for the future. He said he would be uncomfortable with recommendations that are highly specific and feared that such recommendations would be an attempt to guide the future. He said he would like to discuss this issue at a future meeting.

Dr. Zawia said the panel should not change the format of draft reports to leave out risk numbers. He said it is up to the press to do its job responsibly.

Dr. Peelle moved that ORHASP expects written, public comments to receive written, public responses, although those responses need not be elaborate. The panel approved the motion, with Mr. Alexander opposed.

The Panel adjourned.